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EVALUATION OF WALLEYE FOR AN EXPANDED DISTRIBUTION IN IDAHO

IDAHO DEPARTMENT OF FISH AND GAME

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INTRODUCTION

Idaho has a wide spectrum of fish habitats, ranging from coldwater, typical trout habitat of the central Idaho mountains, to the warmer waters of the lower valleys. Native game fishes present when the territory was settled were primarily salmonids (trouts, char, salmon and whitefish). The unique white sturgeon and burbot completed the list of fish that we presently classify as game species.

Near the turn of the century the beginning of an ongoing introduction of nonnative fish species began. The list of salmonids in the state was expanded by the introduction of brown trout, golden trout, brook trout, lake trout and others. Additional important introduced species include five members of the catfish family, eight centrarchids (bass and sunfish), two percids (yellow perch and walleye) and northern pike.

Of 70 species reported as present in Idaho (Simpson and Wallace, 1978), 37 are classified by the state as game fish. Despite the array of available fish there remains a high level of interest in alternate or additional species and the search for superior performing fish continues.

Several factors probably contribute to the desire to import additional species of nonnative fish. Paramount might be the presence of a large amount of water that is of a type of habitat that produces neither good coldwater fisheries nor good warmwater fisheries. Would species adapted to "in between" conditions be more satisfactory? Ease of intrastate travel to a wide range of fishery types and an increase in fishing reports and stories on television and in magazines may also stimulate a desire to duplicate, close to home, some of the better-producing fisheries.

In the last two decades fishery agencies in many states, with Idaho being no exception, have been hard-pressed and often unable to keep pace with the increasing human demands upon fisheries. The 1950's panacea of stocking catchable-sized rainbow trout can no longer fill the need--practically, economically or in the preference of anglers. It is natural, therefore, that people will continue to explore the possibility that additional nonnative fish species will improve the state's fisheries.

Recently, many correspondents have focused particular attention on walleye, Stizostedion vitreum vitreum (Mitchill), as a nonnative fish that purportedly holds great promise for improving Idaho's fisheries. We have reason to believe that some walleye proponents have made and may continue to make illegal introductions of walleye. This practice could prove harmless in some waters, beneficial in others, but could be damaging to some established, prized fish populations. The cost for chemical removal of unwanted fishes has become extreme and we have learned at the cost of much money, time and hard work that chemical treatment is rarely effective for more than a short period.

There was sufficient stimulus for thorough consideration of more use of walleye in Idaho, both within and outside the Department of Fish and Game, that a review group composed of members of the Department's fisheries research section and the University of Idaho's fisheries staff was assembled. The group was charged with providing Departmental guidance on the expansion of walleye distribution. This report provides background information as supplied by the review group and the recommendations of the Department for a short-term walleye expansion program.

Primary considerations in the review process were the limnological and biological compatibility of potential receiving waters for walleye, potential compatibility of walleye with other species, and sociological considerations.

Regardless of our attempts for a completely objective approach, we should not expect this analysis to be accepted by all. Seemingly unchangeable positions, for and against expansion of walleye, have been noted in letters and news articles. Some folks will continue to feel that walleye should play a much greater role in Idaho fisheries, some would like the role to be less, and others will insist upon no further introduction of exotics. However, it is our hope that this analysis will serve as evidence that the issue has received a considered and deliberate review and that the recommendations herein will be accepted as a logical short-term plan for walleye.

DESCRIPTION OF WALLEYE

Taxonomists have categorized walleye as a member of the Class Osteichthyes (bony fishes), Order Perciformes, in the perch family (Percidae) (Bailey et al. 1970). Close relatives to walleye in the perch family include the yellow perch (Perca flavescens) and the sauger (Stizostedion canadense). The yellow perch and the walleye are the only members of the perch family known to be present in Idaho.

Simpson and Wallace (1978) describe the walleye as:

> "Body elongate, spindle shaped, greatest depth at the anterior portion of the first dorsal. Head elongate; mouth large and terminal; jaws of equal length and with strong teeth; cheeks scaleless; maxillary extending to the posterior edge of eye. Lateral line complete, high, slightly curved; lateral line scales usually 85-92, strongly ctenoid. Dorsal fins two and separate; first dorsal high, arched, long; usually 14 strong spines; second dorsal as high or higher with 1 spine and 18-22 rays; caudal fin long and forked; anal fin with 2 spines and 12 or 13 rays; pectoral fins with a single spine. Back and sides olive-buff; back with 6-8 faint black blotches; sides finely mottled with black or brown; belly white."

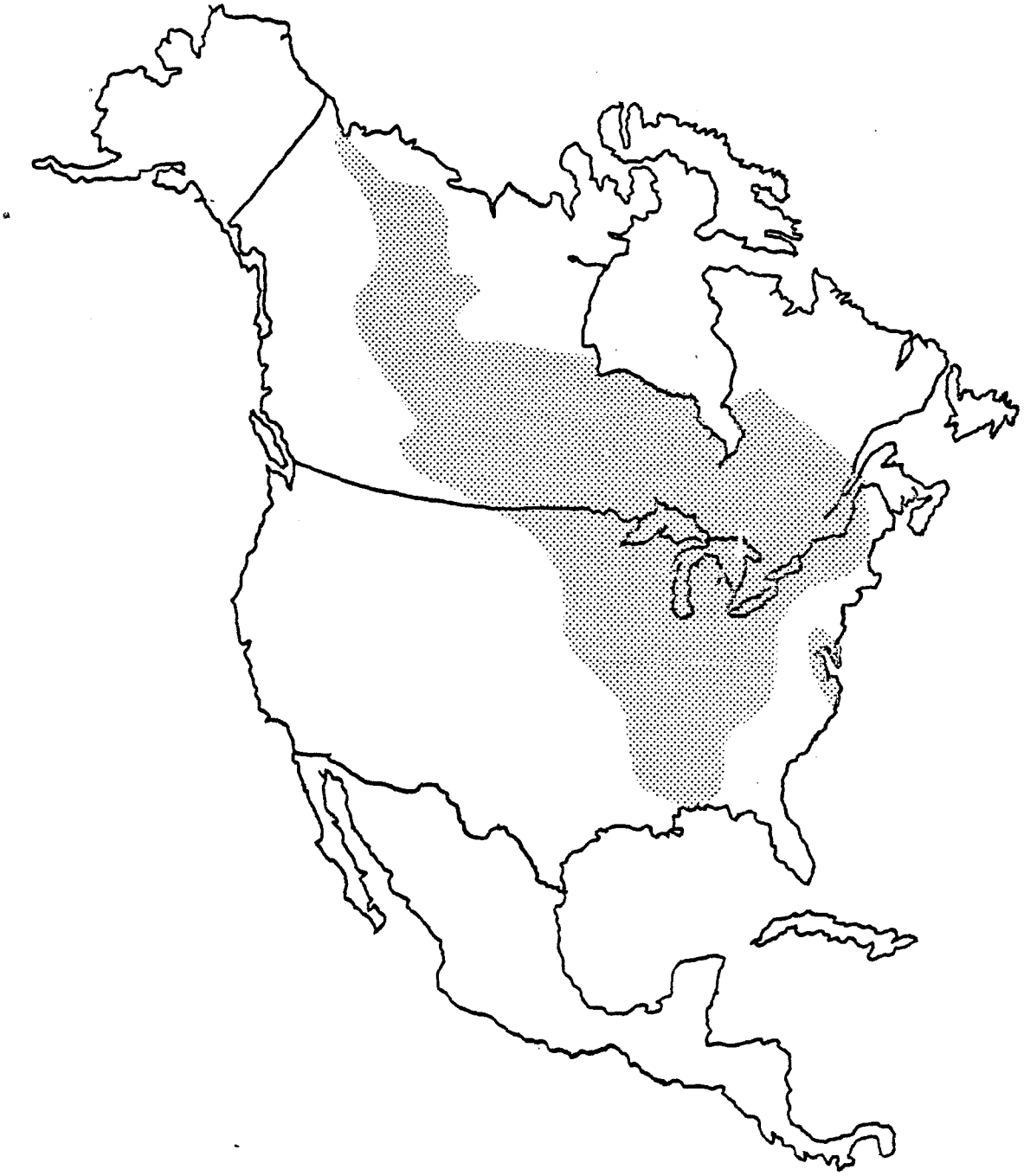

Figure 1. Natural distribution of walleye (Stizostedion v. vitreum) in North America (from Freshwater Fishes of Canada, Scott and Crossman, 1973).

NATURAL HISTORY.

The original distribution of the walleye was limited to the fresh water of North America from the Arctic coast to the Gulf coast and the eastern slopes of the Rocky Mountains to the Atlantic coast (Fig. 1). It occurred from the Mackenzie River in the Northwest Territories, southeast across Hudson's Bay to Quebec, south through New Hampshire, New York and Pennsylvania, along the west slopes of the Appalachian Mountains to Alabama, north and west through the eastern half of states from Oklahoma to North Dakota, then northwest through the Peace, Athabasca and Mackenzie river drainages. A residual, apparently native, stock is found along the central Atlantic seaboard (Pennsylvania to North Carolina). It has been widely introduced within and outside of its original range and is now present in 42 states.

In Idaho, Simpson and Wallace (1978) report that creel census personnel recorded five walleye from Pend Oreille Lake in 1951, but also that they may have been misidentified since no walleye have been reported in Pend Oreille since. The first recorded walleye introduction in the state was in 1974 when the Department obtained two million eggs from Minnesota and stocked walleye in Salmon Falls Reservoir (Twin Falls County) and Mud Lake (Jefferson County). From 1976 through 1979 walleye fry were stocked in Salmon Falls Reservoir and Oneida (Narrows) Reservoir (Franklin County). The Salmon Falls and Oneida introductions have been successful, with four-to-five-pound fish taken from both. The introduction into Mud Lake apparently was unsuccessful, for no walleye have ever been reported. The state record is a 7 lb. 11 oz. walleye taken from Salmon Falls Reservoir.

No authorized distribution, besides that mentioned above, has occurred in Idaho. However, unsubstantiated but plausible rumors have walleye introduced by various means into several bodies of water. The Bear River drainage has produced walleye for anglers up and downstream of Oneida Reservoir (Heimer, pers. comm.). Their distribution apparently has been through natural movement. The Washington Department of Game has introduced walleye into the Columbia River system (most recently the Pend Oreille River) and it is possible that some upstream movement will occur into Idaho waters.

Walleye are present in McNary Reservoir on the Columbia River, which gives them access to the lower Snake River. National Marine Fisheries Service personnel have seen a few walleye in the Snake below Ice Harbor Dam (Bennett 1979). Direct access to the Idaho Snake River via the lower Snake River dams' reservoirs, fish ladders and navigation locks is available. Bennett (1979) speculated that walleye densities in the lower Snake River reservoirs will probably increase over a 20-year span.

WALLEYE REQUIREMENTS

Distribution

Walleye are limited to fresh water although some have been found in brackish water. Stocks originated from the Mississippi and Atlantic glacial refugium. This species forms a dominant part of the fish fauna in large mesotrophic lakes, reservoirs and rivers, particularly in the boreal forest zone. The present range of self-sustaining populations is about 30° to 70° latitude.

Spawning

Spawning occurs in the spring or early summer (March 10 to late June), dependent on latitude and water temperature. An optimal condition for gonadal maturation exists when the fish are exposed to 43°F or lower for 185 days. No viable spawn occurs when fish are maintained at a minimum temperature of 54°F during the winter months. After being exposed to winter temperatures, prespawning behavior may commence when the water temperature is as low as 34°F. Spawning has been known to take place over a temperature range of 36° to 60°F, while the optimum temperature is between 43° to 48°F.

Spawning occurs over a range of substrate from silt, sand, vegetation, coarse gravel, to boulder with the preferred being coarse gravel. Availability of suitable substrate appears to be a critical factor for spawning success (0.6% on mud to 35.7% on gravel rubble) as spawning success generally increases with the size of the gravel. Spawning behavior is such that males arrive on the spawning grounds first and are nonterritorial. Walleyes are broadcast spawners with the eggs being demersal and adhesive and hatching in 12-14 days. Mortality from egg to fry stage has been estimated as high as 99.5% for walleye in poor conditions and about 25% under good conditions. The optimum incubation temperature is 48° to 54°F. Optimum yields of swim-up larvae occur when initiated incubation temperatures are raised 1.8°F/day. Rising temperature regimes also favor shorter hatching periods and a lower incidence of abnormalities. Walleye embryos are tolerant of temperature fluctuations within the 42.8° to 66.6°F range. Wave action and water fluctuations usually have an adverse effect on the spawning grounds by the dewatering of the particular site (note: reservoir fluctuations in certain times with resultant beach erosion continually produced new areas of sandy substrate that are excellent spawning grounds). Also, the strength in a particular year class has been correlated with the June rainfall during the year hatched.

Temperature Requirements

Temperature tolerance for walleye ranges from 32° to 90°F with the physiological optimum being 73°F. The preferred summer water temperature ranges from 69° to 74°F. Based on these characteristics walleye are referred to as a "coolwater" fish.

Preferred Environment

Walleye will usually reach their greatest abundance in large meso-trophic lakes, reservoirs and rivers with Secchi disc measurement readings of one to two meters. Suitable lakes are generally over 1,000 acres. Favorable pH is between 6 and 9. Humic acid-stained lakes are acceptable. They tolerate up to 15,000 mg/1 dissolved solids, with an optimum range of 40-80mg/1 (Colby et al. 1979).

Because their retinal structure is unusually sensitive to light, walleye seek areas of subdued light. Underwater observations made by Ryder (1977) found that adult walleye were active in turbid regions of a lake but rested in contact-with the substrate in clear-water regions during daylight hours.

Young of the Year

The yolk sac absorption is temperature-initiated and occurs rapidly, thus feeding must take place within three days of hatching prior to the disappearance of the yolk sac if the swim-up larvae are to survive. Walleyes demonstrate a change from positive to negative phototaxis by dispersing into the upper levels of open water by 10 to 15 days after hatching and by the latter part of the summer moving toward the bottom. Fry generally feed on zooplankton until about three inches long and then turn to a fish diet. Growth rate of young walleye appears to be more temperature-related than photoperiod-related. The optimum temperature for growth also varies with the initial size or age of the individual (3.3-inch fish is 72^0F while 2.6-inch fish is 77^0F).

GROWTH

Growth of walleye is quite varied among bodies of water and appears to be most affected by temperature and amount of food consumed. A common growth pattern seems to exist for walleye for most bodies of water during their first year of life. Young-of-the-year growth rates gradually increase during spring and early summer, becoming constant throughout the summer until late summer or early autumn, when the rate begins to decrease (Forney and Eipper 1963; Baker 1966; Grinstead 1971). Size and type of forage species has some effect on young-of-the-year walleye growth. Morsell (1970) found that growth of walleye fingerlings in Escanaba Lake, Wisconsin, depended on the size of perch fry, the dominant prey. Walleye growth was the highest when they were more than twice as long as perch fry.

In general, the growth of adult walleyes is fastest in the more southern regions of their range and slower in the more northern regions. Average total lengths at the end of their first year have been observed to range between 2.5 inches (Killens Reservoir, Montana) and 18.1 inches (Belton Reservoir, Texas). As with growth, the average life expectancy of walleye varies with latitude. Where walleyes grow fast and mature early, their life span is shortened. Near the extreme northern limits of its range, the walleye lives to 12-15 years of age, while near the southern limits live expectancy is 5-7 years. Growth rates for walleye inhabiting waters surrounding Idaho are given in Table 1. Limited information from Salmon Falls Reservoir, Idaho, suggests that walleye growth in Idaho waters is consistent with growth in other waters nearby to Idaho.

Table 1. Size and age of walleye in representative Montana, Utah, Washington, and Idaho waters.

AGE	Frenchman Reservoir, Montana Peters (1964)	Huaser Lake, Montana Peters (1964)	Nelson Reservoir, Montana Peters (1964)	Killen Reservoir, Montana-1959 Peters (1964)	Killen Reservoir, Montana-1960 Peters (1964)	Westrope Reservoir, Montana Peters (1964)	Utah Lake, Utah Arnold (1960)	Roosevelt Lake, Washington-1975 Nielsen (1975)	Roosevelt Lake, Washington-1980 Harper et al. (1980)	Salmon Falls Creek Reservoir, Idaho Bell (1982)
1	7.3	6.6	3.7	2.5	3.1	4.3	8.0	8.5	8.0	---
2	13.3	12.8	7.6	6.7	6.7	9.1	13.7	13.8	13.5	12.6
3	15.8	16.9	10.6	11.3	12.0	13.4	16.1	17.3	16.7	18.0
4	18.1	20.7	13.6	15.9	16.0	15.4	18.2	20.9	18.7	---
5	17.7	---	18.5	---	17.6	---	19.9	22.8	20.6	---
6	---	---	25.6	---	---	---	20.4	24.3	22.1	---
7	---	---	---	---	---	---	---	---	23.9	27.5
8	---	---	---	---	---	---	---	---	25.2	---

An inverse relationship between walleye population density and growth has been documented by a number of authors (Carlander 1948; Carlander and Whitney 1961; Koshinsky 1965; Beeton 1966). Growth was rapid in the first year after stocking in Canton Reservoir, Oklahoma, then declined in later years until a stable rate developed, presumably reflecting the stabilization of a growing walleye population (Lewis 1970). Stroud (1949) concluded that a reduction in rapid growth rate of walleyes after nine years of impoundment of Norris Reservoir, Tennessee, was probably due to a decreased food supply, accompanied by an increased population density. Wyoming Game and Fish Department (White, pers. comm.) found that growth rates of walleye slowed considerably in Seminoe Reservoir due to the natural forage species being removed by walleye. Interspecific competition has been cited as a factor contributing to a reduced growth of rate of Lake Winnebago, Wisconsin, walleye which must compete with burbot, sauger and yellow perch for a limited number of forage fishes (Priegle 1969).

A sexual difference in growth rates is characteristic of walleyes, with female individuals exceeding the male growth by as early as the first year (Stroud 1949) or as late as the eighth year (Rawson 1957).

COMPETITION

Competition among walleye and between walleyes and other fish may occur primarily with regard to food supplies. Walleye fry may have to compete with other planktivorous fishes at the juvenile stage. Johnson (1969) suggested that competition for food in Lake Winnibigoshish and Cutfoot Sioux Lake, Wisconsin, occurs mostly during the first 60 days of life, when the young walleyes are feeding largely on plankton and insects, or when they are making the transition to a predominantly fish diet. However, cannibalism can be the most important source of fry mortality, especially when food is scarce. Forney (1974) found in Oneida Lake, New York, that cannibalism by older walleyes increased during periods of low levels of yellow perch abundance, suggesting that yellow perch act as a buffer species controlling the degree of cannibalism.

Adult walleye are known to.compete for food with such fish as northern pike, yellow perch, sauger, smallmouth bass and largemouth bass. In Wilson Lake, Minnesota, Johnson (1977) demonstrated that the walleye standing crop in a relatively simple fish community could be increased as much as one-third with white sucker removal. In this instance white suckers were the primary competitor with walleyes and other predators for insect food.

Being a top predator, adult walleye are not usually preyed upon by other fish species. Northern pike is probably the most important predator on adult walleye over much of its range (Scott and Crossman 1973). However, a number of other species of fish including carp, perch and bullheads will prey on walleye eggs.

Walleyes can probably outcompete most other fish species and can probably adversely affect game fish species when the forage food base is limited. Beard (1982) found that when walleye fingerlings were introduced into Camp Lake, Wisconsin, they were effective predators on bluegill fingerlings.

The Utah Division of Wildlife Resources found that Utah chub were incapable of maintaining themselves in the face of substantial walleye populations. In Lake Powell, where a substantial threadfin shad population exists, the walleye were influencing the largemouth bass and crappie populations (Andriano, pers. comm., see Appendix). Wyoming's efforts in expanding walleye range have shown that in reservoirs originally stocked with salmonids, walleye predation on trout caused revision in management plans for these bodies of water.

Although walleyes in some lakes and streams share their spawning grounds with suckers and northern pike, which spawn more or less concurrently, no serious competition for spawning grounds has been reported in the literature.

Carp serve poorly as a forage species due to their rapid growth rate. Priegle (1970) observed that considerable walleye egg mortality can result when carp move into walleye spawning marshes to spawn immediately after completion of the walleye run. In the process of spawning, the carp roil up the bottom and dislodge the walleye eggs from the vegetative mats, causing them to settle on the silt bottom where they quickly die from lack of oxygen.

In Idaho, a serious concern is the potential of walleye to impact salmonids. Case histories of what happens when walleye and salmonids are forced to coexist are not common. Most state fishery agencies have avoided placing walleye into direct competition with salmonids. The Montana department's philosophy is that introducing walleye in trout waters does not have a very high potential for improving fishing and, also, has a potential for causing damage to native species (Whitney, pers. comm., see Appendix).

Walleye have not been introduced in northern California because of concern for their possible impact on salmon, steelhead, sturgeon and striped bass (Fisk, pers. comm., see Appendix).

Utah's department has not introduced walleye and salmonids together because they believe that salmonids could not compete with walleye (Andriano, pers. comm., see Appendix). However, they are considering expanding their walleye program in waters of the "cool water" type.

In New Mexico, it is suspected that walleye are suppressing trout in the one lake where both species are present. The New Mexico department has resisted stocking walleye in salmonid waters (McCleskey, pers. comm., see Appendix).

The policy of Colorado Division of Wildlife is to not stock walleye in trout waters (Woodling, pers. comm., see Appendix). In Lake Roosevelt, Washington, the abundance of trout did not appear to be harmed with the increase in walleye. However, Lake Roosevelt is a very large and complex ecosystem with the probability that several species serve as a buffer between walleye and trout.

Bennett (1979) reviewed salmonid and walleye interactions and found evidence of adverse effects of walleye upon trout in reservoirs of the North Platt drainage of Wyoming, where walleye were found to feed heavily upon newly-released hatchery trout. The Wyoming experience was amplified by Joe White, State Fish Warden (see Appendix), who stated, "In any reservoir that was originally stocked with salmonids, the competition with the walleye or possibly lack of competition, since the salmonids appear to be quickly eaten, have required a complete revision of our management plans. On some of these lakes it is completely impractical now to stock fingerling trout because returns to the creel are extremely low. This is almost certain in most instances to be a direct result of walleye predation. I cannot think of a single place where I consider a walleye fishery and a trout fishery as being compatible."

Feeding of Columbia River walleye was started by Maule (pers. comm., see Appendix), who found that salmonids comprised about 5% of walleye stomach contents. However an impact assessment is not presently possible due to the lack of a population estimate for walleye.

FISHERY CHARACTERISTICS

Where walleye provide well-established fisheries they are highly esteemed. Popular writers frequently refer to their top-quality table value. Carhart (1949) attested that "You can eat walleye longer, day after day, meal after meal, without balking, than any other fish I know." Niemuth et al. (1962) described the flesh as "...firm, white, fairly dry, bone-free...(and) highly prized as a food fish." An angler survey in Ontario, Canada, showed that the walleye was the game species most often sought (Scott and Crossman 1973).

Sporting qualities are less frequently referred to in the literature. Madsen (1982) characterized walleye in Nebraska as putting up a short, hard fight, but lacking the flourish and stamina of rainbow trout or largemouth bass.

Fishing methods vary according to walleye behavior at different yearly seasons. Harlan and Speaker (1956) report in Iowa that "...the time-honored method of trolling with minnow-spinner combinations or artificial lures is usually as productive as any." Scott and Crossman (1956) report angling methods as "...still fishing with live minnows as bait or with artificial lures such as spinners, spoons, plugs and jigs. Drifting and trolling seek out the schools of moving walleye. The two twilight periods of sunset and sunrise are the most productive." Baits that simulate a forage fish seem to be the universal standard.

Effective walleye fishing apparently requires some specialization. Baxter and Simon (1970) suggested for Wyoming that anglers be educated to the art of catching walleye. Prentice et al. (1977) noted that "...many Texas fishermen have complained that walleye are too difficult to catch..." and recommended information and education programs to aid fishermen in harvesting walleye. Goodson (1966) reported similar harvest problems with walleye in California. It is possible that coverage in the popular communications media and an increased communication among fishermen has lessened this problem.

In Wisconsin, anglers find walleye fishing most productive either while ice fishing or soon after spawning, but experience difficulty catching walleye in the summer (Klingbiel, pers. comm., Wisconsin Department of Natural Resources). Colby et al. (1979), after reviewing catch rates for 105 bodies of water, rated a catch of 0.3 walleye per hour as a good fishery. The "good" catch rates were common in Ontario waters, but much less frequent in United States waters. In Roosevelt Lake, Washington, boat anglers averaged a comparatively good catch rate of 0.51 walleye/hr. and bank anglers 0.1 walleye/hr. in 1980 (Harper et al. 1980).

Rye Patch Reservoir, Nevada, provided a poor walleye catch rate of 0.01/hr. in 1980 (Weller 1981).

In a review of angling exploitation for eight U.S. and Canadian waters, Colby et al. (1979) found a range of 7% to 47% of the walleye population being harvested. The average exploitation was 22%. In Wisconsin, Mraz (1968) indicated 25% for an average representative annual exploitation rate, with any broad deviations to be considered as unusually high or low exploitation.

FISHERY MANAGEMENT PRACTICES

Most of the usual means to reduce exploitation, such as creel and size limits, and season closures, have been practiced with walleye with varying degrees of effectiveness. Colby et al. (1979) reports daily catch limits for states and Canadian provinces generally range from 6-10 with extremes of 5 and 15 also noted. Idaho's present limit of 5 is among the most restrictive.

In Washington's Roosevelt Lake, anglers are allowed to take 15 walleye, of which no more than five can exceed 20 inches. Harper et al. (1980) points out that the Washington limits do not significantly affect harvest since the limiting criteria are seldom attained.

Season closures are commonly used to protect spawners in the spring (one to three months). However, year-round fishing does occur in many states. Immature walleye are often protected by minimum size limits that range from 12-15 inches.

Nebraska provides no closed season for walleye and no size limit, except in one experimental situation (Madsen 1982). Wisconsin, which lies in the center of the original range of walleye, typically regulates walleye fishing with a spawning season closure (1 March to 1 May), a bag limit of five, and no length limit (Klingbiel, pers. comm.)

HATCHERY PRACTICES

Stocking walleye has proven effective in many cases as a means of establishing new populations or augmenting weak populations. Maintenance stocking programs are common in waters with unfavorable conditions for natural reproduction.

In midwestern states walleye eggs for stocking programs are obtained from wild fish that are netted on spawning grounds. Incubation is done in hatching jars. Drainable "natural" ponds are used for rearing. Such ponds require intensive management of nutrients to support the early rearing food supply, and periodic partial harvest to reduce cannibalism and promote growth throughout the population. Forage fish must be used to grow walleye beyond an advanced fingerling stage (Klingbiel 1969).

Stocking rates used in the midwest are extremely variable from state to state. Usually any relationship between stocking rate and influence upon a population is not obvious. Wisconsin uses a sliding scale guideline based upon the size of lakes, whereby a 100-acre lake would receive 20 fingerlings/acre and a 1,000-acre lake would receive 7.8/acre (Klingbiel 1969).

Maintenance stocking of fry in a Colorado reservoir was prescribed for four-year cycles as follows, after ten years of study (Puttmann and Weber 1980):

Year 1 - Stock at 2,000 fry/surface acre
Year 2 - Stock at 3,000 fry/surface acre
Year 3 - No stocking
Year 4 - No stocking

Rearing and stocking regimes for walleye differ considerably from techniques used for salmonids. Concrete raceways and manufactured feeds are not usable. In Idaho, unless new facilities are developed, stocking newly hatched fry as has been done in the past is the only practical means of stocking.

The Department has stocked walleye fry in five past years (Table 2). In two years, eyed eggs were obtained out-of-state, incubated at Department hatcheries and stocked as newly-hatched fry. In the later years fry from out-of-state were delivered directly to the receiving waters by the U.S. Fish and Wildlife Service. The fry stocking has produced fisheries and reproducing populations in Oneida and Salmon Falls reservoirs.

Idaho's stocking data show that fry stocking densities of about 400 and 1,200 per surface acre have produced satisfactory results at Salmon Falls and Oneida reservoirs, respectively. Mud Lake, which received only 63 per surface acre, may have been understocked.

SUITABILITY OF IDAHO WATERS

In reviewing Idaho waters to determine their potential suitability for establishment of walleye, we considered the following main factors on a water-by-water basis:

1. Physical suitability - such as, size of a body of water, depth, drawdown during spawning period, availability of spawning substrate, water clarity and temperature.

2. Biological suitability - mainly the presence or potential for an abundance of forage fish.

3. Suitability regarding connecting drainages - the potential for walleye to spread into connecting waters where their establishment would conflict with other fisheries.

4. Adequacy of existing fishery, and compatibility with existing fishery or with firmly established management goals.

We reviewed most lakes and reservoirs in the state that exceed about 100 acres. Certain exclusions were made for reasons of obvious unsuitability, such as alpine lakes and the oligotrophic Stanley Basin lakes.

Table 2. History of walleye fry stocking in Idaho.

Year	Hatchery	Source	Receiving Water	Number
1974	Ashton	Minnesota	Mud Lake	455,000
1974	Twin Falls	Minnesota	Salmon Falls Reservoir	1,502,000
1975	None Stocked			
1976	American Falls	Utah	Oneida Reservoir	525,000
1976	Twin Falls	Utah	Salmon Falls Reservoir	862,000
1977	Federal	Kansas	Oneida Reservoir	1,000,000
1977	Federal	Kansas	Salmon Falls Reservoir	1,700,000
1978	Federal	So. Dakota	Salmon Falls Reservoir	750,000
1978	Federal	So. Dakota	Oneida Reservoir	250,000
1979	Federal	Kansas	Salmon Falls Reservoir	1,300,000
1979	Federal	Kansas	Oneida Reservoir	700,000
1980	None Stocked			
1981	None Stocked			
1982	None Stocked			

The ideal body of water to consider for nonnative fishes would be one that is physically and biologically well-suited, on a closed water system to prevent spread where unwanted, and with no presently outstanding fishery or well-supported fishery restoration plans.

Perhaps the most difficult of the criteria to address was the matter of connecting water systems. The Lake Roosevelt experience, with the spread of walleye down the Columbia River, clearly demonstrates the ability of walleye to spread their range. Closed water systems that are without potential for the spread of fish into other waters are rare in Idaho.

In the Panhandle region most bodies of water eventually join the Kootenai, Pend Oreille or Spokane rivers. Many waters that would otherwise be likely candidates for walleye connect directly with Pend Oreille and Coeur d'Alene lakes where kokanee fishery management is a major consideration.

South of the Panhandle, nearly all waters connect with the Snake River. Any thought of walleye in the upper Snake must also consider the eventuality that they would spread through the lower drainage. We believe that walleye will eventually spread their range up through the lower Snake River reservoirs and perhaps into Hells Canyon. However, this eventuality may take many years to occur. Also, the long-term outlook for the Brownlee-Oxbow-Hells Canyon reservoir fisheries is not clear. These reservoirs presently support good fisheries of both the coldwater and warmwater types. It is likely that this condition will continue, but we will have a better knowledge of these fisheries after research that will begin in 1983. The present good health of the mixed coldwater-warmwater fisheries suggests that conditions in the mid-Snake reservoirs are quite favorable for walleye. However, given the presently good status of the Brownlee-Oxbow-Hells Canyon reservoir fisheries, there is no urgency to introduce new species into those impoundments.

Inasmuch as some impact on anadromous salmonids by walleye in the lower Snake River is possible, the expansion of the walleye's range into the lower Snake should not be hastened. The many millions of dollars that have been and continue to be invested by the many federal, state and private groups to arrest and improve the declined status of the Snake River anadromous fish runs are simply too vast to allow support for action that can prove to be of further detriment. Therefore, we recommend that walleye not be introduced at this time into Snake River impoundments or waters that connect to the Snake. The matter should be reconsidered at such time that walleye may have penetrated and become established in the lower Snake reservoirs.

Forage for walleye can be a limiting factor in many of the waters under consideration. We considered waters with multiple forage species as the most suitable for walleye. Yellow perch are the universal forage species throughout much of the natural range of walleye and are present from border to border in Idaho. Yellow perch would be our choice to work with in any attempt to manage a forage base for walleye in Idaho. Waters that will not support abundant yellow perch are low in productivity, thus would not be attractive prospects for walleye. Also, yellow perch provide popular panfish fisheries, which can not be said of most other forage species.

Water temperature of Idaho waters would not be a limiting factor for walleye. Generally, the high and low seasonal temperature ranges are well within the walleye's tolerance range.

Another difficult aspect to consider is whether walleye would be compatible with a highly-regarded existing fishery or with firmly established management goals or fishery restoration plans. Inasmuch as walleye have the potential for making significant depletions of lower food chain fishes, we should heed the cautions expressed by other state fishery experts and not introduce walleye where they may impact desirable existing fisheries. An example would be Magic Reservoir, which supports a highly esteemed trout fishery. Magic would probably support walleye, but to risk impacting the rainbow fishery would be unwise.

Some waters, such as Hayden Lake and Henrys Lake, have fisheries that are not performing as well as our expectations, but firm commitments have been made to improve the salmonid stocks and restoration programs are underway. At Pend Oreille Lake a multi-million dollar hatchery is being sought to restore the kokanee fishery. In these instances, it would be contradictory to consider introducing competitive species unless, of course, we are willing at this time to change the long-term goals.

A frequently mentioned concern averse to importing walleye, even in a limited number of isolated waters, is that it would facilitate unauthorized introductions by providing a more handy source of the fish. We gave this view little credence, feeling that the ease of modern transport already makes it possible to move fish over long distances and that anyone seriously inclined to do so could accomplish an illegal transplant from existing sources of walleye.

Our approach was to identify waters for introduction of walleye where they would not have a high likelihood to impact:

1. An existing desirable fishery;
2. A course of action that is underway or planned to restore or enhance a fishery,
3. Anadromous fish, or
4. Stocks that are afforded priority consideration by Commission policy.

The following process attempts to identify those waters that have the physical and biological potential for supporting walleye, along with a listing of constraints in accordance with the foregoing criteria. An overall assessment generalizes the suitability of each water for walleye.

The assessments are necessarily largely subjective, due to the large number of waters involved. University of Idaho staff is currently developing a computer model that will help predict, in more detail and precision, the potential that individual waters have for establishment of walleye. Development of this model should be completed during the next year.

KOOTENAI RIVER DRAINAGE

McArthur Reservoir
200 acres, 30 feet maximum depth
Species[1]: Rb, Bk, Per, Su, Ch
Primary fisheries: Rb, Bk
Physical suitability: fair
Biological suitability: good
Drainage compatibility: poor, due to connection with Kootenay Lake, B.C., where intensive kokanee restoration program is underway
Compatibility with management goals: present fishery is not highly regarded, therefore, goal changes may be possible
Overall assessment:
1. May support walleye at moderate level
2. Unsuitable due to drainage incompatibility

PEND OREILLE RIVER DRAINAGE

Upper Priest Lake
5,120 acres, 98 feet maximum depth
Species: Kok, Ct, Wf, Bt, Lt, Rb, Sq, Su, Sh
Primary fisheries: Kok, Ct
Physical suitability: fair
Biological suitability: fair
Drainage compatibility: poor, due to connection with Priest and Pend Oreille lakes, where kokanee restoration programs are underway
Compatibility with management goals: may conflict with westslope cutthroat trout management
Overall assessment:
1. May support walleye at low level.
2. Unsuitable due to conflict with trout management.
3. Unsuitable due to drainage incompatibility.

Priest Lake
23,680 acres, 367 feet maximum depth
Species: Kok, Rb, Ct, Bt, Brk, Lmb, Lt, Wf, Sq, Su, Sh
Primary fisheries: Kok, Lt, Ct
Physical suitability: fair
Biological suitability: fair
Drainage compatibility: poor, due to connection with Lake Pend Oreille, where kokanee restoration program is underway Compatibility with management goals: may conflict with kokanee, lake trout and cutthroat trout restoration
Overall assessment:
1. May support walleye at low level.
2. Unsuitable due to conflicts with salmonid population restoration at Priest and Pend Oreille lakes.

[1] See Appendix for species abbreviations list.

Pend Oreille Lake
94,600 acres, 1,152 feet maximum depth
Species: Kok, Rb, Ct, Wf, Bt, Per, Lmb, Bn
Primary fisheries: Kok, Rb, Bt
Physical suitability: fair
Biological suitability: poor, except for some sloughs and backwaters
Drainage compatibility: no conflict downstream of Albeni Falls Dam
Compatibility with management goals: inconsistent with major efforts to restore kokanee
Overall assessment:
1. May support walleye at low level
2. Unsuitable due to conflict with kokanee management

Round Lake
120 acres, 37 feet maximum depth
Species: Rb, Bk, Per, Lmb, Pu
Primary fisheries: Rb, Per, Pu, Lmb
Physical suitability: fair
Biological suitability: fair
Drainage compatibility: poor, due to connection with Lake Pend Oreille
Overall assessment:
1. May support walleye at low level
2. Unsuitable due to drainage incompatibility

Cocolalla Lake
800 acres, 42 feet maximum depth
Species: Rb, Bk, Ct, Per, Pu, Bh, Su
Primary fisheries: Rb
Physical suitability: good
Biological suitability: good
Drainage compatibility: poor, due to connection with Lake Pend Oreille
Overall assessment:
1. May support walleye at moderate level
2. Unsuitable due to drainage incompatibility

Shepherd Lake
100 acres, 40 feet maximum depth
Species: Lmb, Cr, Per, Pu Primary
fisheries: Cr, Lmb Physical
suitability: fair Biological
suitability: fair
Drainage compatibility: poor, due to connection with Lake Pend Oreille
Overall assessment:
1. May support walleye at low level
2. Unsuitable due to existing popular panfish fishery
3. Unsuitable due to drainage incompatibility

Gamble Lake
130 acres, 40 feet maximum depth
Species: Lmb, Cr, Per, Pu
Primary fisheries: Lmb, Cr
Physical suitability: fair
Biological suitability: fair
Drainage compatibility: poor, due to connection with Lake Pend Oreille
Overall assessment:
1. May support walleye at low level.
2. Unsuitable due to existing popular panfish fishery.
3. Unsuitable due to drainage incompatibility.

Spirit Lake
1,280 acres, 100 feet maximum depth
Species: Rb, Bk, Kok, Lmb, Per, Pu, Su, Cr, Bh
Primary fisheries: Kok, Rb, Lmb, Per
Physical suitability: good
Biological suitability: good
Drainage compatibility: good (closed system)
Compatibility with management goals: maintenance of kokanee fishery would be a concern if kokanee were utilized as forage
Overall assessment:
1. May support a good walleye population
2. Monitor changes in species composition and abundance if walleye are introduced.

SPOKANE RIVER DRAINAGE

Hauser Lake
550 acres, 70 feet maximum depth
Species: Rb, Ct, Bk, Lmb, Per, Cr, Bh, Pu, Su, Te, Sq, Sh
Primary fisheries: Rb
Physical suitability: good
Biological suitability: good
Drainage compatibility: good (closed system)
Compatibility with management goals: could continue present popular rainbow trout fishery by stocking catchable-sized fish.
Overall assessment:
1. May support a good walleye population
2. Minimal conflict with present programs

Twin Lakes

960 acres, 32 feet maximum depth
Species: Rb, Ct, Bk, Per, Lmb, Cr, Bh, Pu, Su, Te, Sq, Sh
Primary fisheries: Rb, Lmb
Physical suitability: good
Biological suitability: good
Drainage compatibility: good (closed system)
Compatibility with management goals: could continue present popular rainbow trout fishery by stocking catchable-sized fish
Overall assessment:

1. May support a good walleye population
2. Minimal conflict with present programs

Hayden Lake

4,200 acres, 197 feet maximum depth
Species: Rb, Ct, Cr, Lmb, Per, Sq, Te
Primary fisheries: Rb, Ct, Cr, Per
Physical suitability: good
Biological suitability: fair
Drainage compatibility: good (closed system)
Compatibility with management goals: inconsistent with westslope cutthroat restoration program Overall assessment:

1. May support walleye at low level
2. Unsuitable due to conflict with cutthroat management
3. Confirm public preferences for species management at Hayden Lake

Coeur d'Alene Lake

25,072 acres, 200 feet maximum depth
Species: Kok, Rb, Ct, Lmb, Per, Cr, Bh, Sq, Np, Su, Sh, Te
Primary fisheries: Kok, Ct, Bh
Physical suitability: good
Biological suitability: fair
Drainage compatibility: no conflict downstream of Post Falls Dam
Compatibility with management goals: maintenance of major kokanee fishery and native cutthroat population are concerns Overall assessment:

1. May support a good walleye population
2. May conflict with cutthroat trout management, primarily in lower St. Joe River
3. Determine public preferences for species management at Coeur d'Alene Lake
4. Determine walleye-kokanee interaction at a less important fishery, such as Spirit Lake, before deciding action for Coeur d'Alene Lake

Fernan Lake

300 acres, 21 feet maximum depth
Species: Lmb, Per, Cr, Rb, Ct, Su, Te, Sq, Sh
Primary fisheries: Lmb, Per, Rb
Physical suitability: good
Biological suitability: fair
Drainage compatibility: connects with Coeur d'Alene Lake
Overall assessment:

1. May support a fair walleye population
2. Contingent upon action at Coeur d'Alene Lake

Anderson Lake

720 acres, 15 feet maximum depth
Species: Lmb, Cr, Per, Bh, Np, Rb, Ct, Sq, Ch, Su, Sh, Te
Primary fisheries: Lmb, Bh, Cr
Physical suitability: fair
Biological suitability: good
Drainage compatibility: connects with Coeur d'Alene Lake
Overall assessment:

1. May support a fair walleye population
2. Contingent upon action at Coeur d'Alene Lake

Thompson Lake

190 acres, 25 feet maximum depth
Species: Lmb, Cr, Per, Bh, Np, Rb, Ct, Sq, Ch, Su, Sh, Te
Primary fisheries: Lmb, Bh, Cr
Physical suitability: fair
Biological suitability: good
Drainage compatibility: connects with Coeur d'Alene Lake
Overall assessment:

1. May support a fair walleye population
2. Contingent upon action at Coeur d'Alene Lake

Blue Lake

200 acres, 13 feet maximum depth
Species: Lmb, Cr, Per, Bh, Np, Rb, Ct, Sq, Ch, Su, Sh, Te
Primary fisheries: Lmb, Bh, Cr
Physical suitability: fair
Biological suitability: good
Drainage compatibility: connects with Coeur d'Alene Lake
Overall assessment:

1. May support a fair walleye population
2. Contingent upon action at Coeur d'Alene Lake

Black Lake

400 acres, 25 feet maximum depth
Species: Lmb, Cr, Per, Bh, Np, Rb, Ct, Sq, Ch, Su, Sh, Te
Primary fisheries: Lmb, Bh, Cr
Physical suitability: fair
Biological suitability: good
Drainage compatibility: connects with Coeur d'Alene Lake
Overall assessment:

1. May support a fair walleye population
2. Contingent upon action at Coeur d'Alene Lake

Swan Lake

660 acres, 21 feet maximum depth
Species: Lmb, Cr, Per, Bh, Np, Rb, Ct, Sq, Ch, Su, Sh, Te
Primary fisheries: Lmb, Bh, Cr
Physical suitability: fair
Biological suitability: good
Drainage compatibility: connects with Coeur d'Alene Lake
Overall assessment:

1. May support a fair walleye population
2. Contingent upon action at Coeur d'Alene Lake

Cave Lake

700 acres, 25 feet maximum depth
Species: Lmb, Cr, Per, Bh, Np, Rb, Ct, Sq, Ch, Su, Sh, Te
Primary fisheries: Lmb, Bh, Cr
Physical suitability: fair
Biological suitability: good
Drainage compatibility: connects with Coeur d'Alene Lake
Overall assessment:

1. May support a fair walleye population
2. Contingent upon action at Coeur d'Alene Lake

Medicine Lake

340 acres, 20 feet maximum depth
Species: Lmb, Cr, Per, Bh, Np, Rb, Ct, Sq, Ch, Su, Sh, Te
Primary fisheries: Lmb, Bh, Cr
Physical suitability: fair
Biological suitability: good
Drainage compatibility: connects with Coeur d'Alene Lake
Overall assessment:

1. May support a fair walleye population
2. Contingent upon action at Coeur d'Alene Lake

Killarney Lake

500 acres, 25 feet maximum depth
Species: Lmb, Cr, Per, Bh, Np, Rb, Ct, Sq, Ch, Su, Sh, Te
Primary fisheries: Lmb, Bh, Cr
Physical suitability: fair
Biological suitability: good
Drainage compatibility: connects with Coeur d'Alene Lake
Overall assessment:

1. May support a fair walleye population
2. ontingent upon action at Coeur d'Alene Lake

Rose Lake

300 acres, 16 feet maximum depth
Species: Lmb, Cr, Per, Bh, Np, Rb, Ct, Sq, Ch, Su, Sh, Te
Primary fisheries: Lmb, Bh, Cr
Physical suitability: fair
Biological suitability: good
Drainage compatibility: connects with Coeur d'Alene Lake
Overall assessment:

1. May support a fair walleye population
2. Contingent upon action at Coeur d'Alene Lake

Bull Run Lake

100 acres, 20 feet maximum depth
Species: Lmb, Cr, Per, Bh, Np, Rb, Ct, Sq, Ch, Su, Sh, Te
Primary fisheries: Lmb, Bh, Cr
Physical suitability: fair
Biological suitability: good
Drainage compatibility: connects with Coeur d'Alene Lake
Overall assessment:

1. May support a fair walleye population
2. Contingent upon action at Coeur d'Alene Lake

Hidden Lake

100 acres, 40 feet maximum depth
Species: Lmb, Cr, Per, Bh, Np, Rb, Ct, Sq, Ch, Su, Sh, Te
Primary fisheries: Lmb, Bh, Cr
Physical suitability: fair
Biological suitability: good
Drainage compatibility: connects with Coeur d'Alene Lake
Overall assessment:

1. May support a fair walleye population
2. Contingent upon action at Coeur d'Alene Lake

Chatcolet Lake

877 acres, 35 feet maximum depth
Species: Lmb, Cr, Per, Bh, Np, Rb, Ct, Sq, Ch, Su, Sh, Te
Primary fisheries: Lmb, Bh, Cr
Physical suitability: fair
Biological suitability: good
Drainage compatibility: connects with Coeur d'Alene Lake
Overall assessment:

1. May support a fair walleye population
2. Contingent upon action at Coeur d'Alene Lake

Round Lake
400 acres, 37 feet maximum depth
Species: Lmb, Cr, Per, Bh, Np, Rb, Ct, Sq, Ch, Su, Sh, Te
Primary fisheries: Lmb, Bh, Cr
Physical suitability: fair
Biological suitability: good
Drainage compatibility: connects with Coeur d'Alene Lake
Overall assessment:
1. May support a fair walleye population
2. Contingent upon action at Coeur d'Alene Lake

Benewah Lake
400 acres, 20 feet maximum depth
Species: Lmb, Cr, Per, Bh, Np, Rb, Ct, Sq, Ch, Su, Sh, Te
Primary fisheries: Lmb, Bh, Cr
Physical suitability: fair
Biological suitability: good
Drainage compatibility: connects with Coeur d'Alene Lake
Overall assessment:
1. May support a fair walleye population
2. Contingent upon action at Coeur d'Alene Lake

CLEARWATER RIVER DRAINAGE

Dworshak Reservoir
16,417 acres, 633 feet maximum depth
Species: Rb, Smb, Kok, Su, Sh, Sq
Primary fisheries: Kok, Rb, Smb
Physical suitability: fair
Biological suitability: fair
Drainage compatibility: poor, connects with lower Snake River
Compatibility with management goals: management of kokanee and rainbow trout fisheries are concerns
Overall assessment:
1. May support a low walleye population
2. May conflict with salmonid fishery management
3. Unsuitable due to drainage incompatibility

WEISER RIVER DRAINAGE

Lost Valley Reservoir
633 acres, 24 feet maximum depth
Species: Rb, Bk, Per
Primary fisheries: Rb, Per
Physical suitability: fair
Biological suitability: fair
Drainage compatibility: poor, connects with lower Snake River
Overall assessment:
1. May support a low walleye population
2. Unsuitable due to drainage incompatibility

Mann Creek Reservoir

283 acres, 124 feet maximum depth
Species: Rb, Lmb, Su, Sh, D
Primary fisheries: Rb, Lmb
Physical suitability: fair
Biological suitability: fair
Drainage compatibility: Poor, connects with lower Snake River
Overall assessment:

1. May support a low walleye population
2. Unsuitable due to drainage incompatibility

Crane Creek Reservoir

3,270 acres, 73 feet maximum depth
Species: Lmb, Cr, Bh, Cp, Sh
Primary fisheries: Lmb, Cr
Physical suitability: fair
Biological suitability: fair
Drainage compatibility: poor, connects with lower Snake River
Overall assessment:

1. May support a fair walleye population
2. Unsuitable due to drainage incompatibility

PAYETTE RIVER DRAINAGE

Black Canyon Reservoir

1,100 acres, 112 feet original maximum depth, but lessened by siltation
Species: Lmb, Smb, Cr, Bg, Bh, Per, Cp, Su, Sq, D
Primary fisheries: Lmb, Smb, Cr, Per
Physical suitability: poor, due to drawdown and siltation
Biological suitability: poor
Drainage compatibility: poor, connects with lower Snake River
Overall assessment:

1. May not support walleye due to winter flushing flow
2. Unsuitable due to drainage incompatibility

Little Payette Lake

1,450 acres, 17 feet maximum depth
Species: Kok, Rb, Bk, Su, Sq
Primary fisheries: Kok, Rb Physical
suitability: fair Biological
suitability: good
Drainage compatibility: poor, connects with lower Snake River
Overall assessment:

1. May support a low walleye population
2. Unsuitable due to drainage incompatibility

Upper Payette Lake
315 acres, 90 feet maximum depth
Species: Rb, Bk, Su, Sq, Sh
Primary fisheries: Rb
Physical suitability: fair
Biological suitability: fair
Drainage compatibility: poor, connects with lower Snake River
Overall assessment:
1. May support a low walleye population
2. Unsuitable due to drainage incompatibility

Payette Lake
5,337 acres, 290 feet maximum depth
Species: Kok, Rb, Lt, Su, Sq.
Primary fisheries: Kok, Rb
Physical suitability: poor
Biological suitability: poor
Drainage compatibility: poor, connects with lower Snake River
Overall assessment:
1. May not support walleye
2. Unsuitable due to drainage incompatibility

Cascade Reservoir
28,300 acres, 75 feet maximum depth
Species: Rb, Co, Kok, Bh, Per, Su, Sq, Sh
Primary fisheries: Rb, Co, Per
Physical suitability: good
Biological suitability: good
Drainage compatibility: poor, connects with lower Snake River
Compatibility with management goals: highly regarded salmonid fisheries maintenance is a concern
Overall assessment:
1. May support a fair walleye population
2. Unsuitable due to drainage incompatibility

Paddock Valley Reservoir
1,302 acres, 47 feet maximum depth
Species: Cr, Lmb, Bh
Primary fisheries: Cr, Lmb
Physical suitability: fair
Biological suitability: good
Drainage compatibility: poor, connects with lower Snake River
Compatibility with management goals: maintenance of existing highly-regarded crappie fishery is a concern
Overall assessment:
1. May support a fair walleye population
2. Unsuitable due to drainage incompatibility

BOISE RIVER DRAINAGE

Lake Lowell
9,800 acres, 74 feet maximum depth
Species: Lmb, Cr, Per, Bh, Rb, Smb, Cp, Su, Sq, Sh
Primary fisheries: Lmb, Cr, Bh, Per
Physical suitability: fair
Biological suitability: good
Drainage compatibility: poor, connects with lower Snake River
Overall assessment:
1. May support a moderate walleye population.
2. Unsuitable due to drainage incompatibility.

Blacks Creek Reservoir
300 acres, 48 feet maximum depth
Species: Lmb, Per, Bh
Primary fisheries: Per, Bh
Physical suitability: fair
Biological suitability: fair
Drainage compatibility: poor, connects with lower Snake River
Overall assessment:
1. May support walleye at low level
2. Unsuitable due to drainage incompatibility

Lucky Peak Reservoir
2,850 acres, 240 feet maximum depth
Species: Rb, Wf, Kok, Smb, Bt, Per, Su, Sq, Sh, Ch
Primary fisheries: Rb, Kok, Smb
Physical suitability: fair
Biological suitability: fair
Drainage compatibility: poor, connects with lower Snake River
Overall assessment:
1. May support walleye at low level
2. Unsuitable due to drainage incompatibility

Arrowrock Reservoir
3,100 acres, 257 feet maximum depth
Species: Rb, Bt, Kok, Wf, Su, Sq, Sh, D, Ch
Primary fisheries: Rb, Kok
Physical suitability: fair
Biological suitability: fair
Drainage compatibility: poor, connects with lower Snake River
Overall assessment:
1. May support walleye at low level
2. Unsuitable due to drainage incompatibility

Anderson Ranch Reservoir
4,750 acres, 332 feet maximum depth
Species: Rb, Kok, Wf, DV, Smb, Per, Sq, Su, Ch, Sh
Primary fisheries: Rb, Kok
Physical suitability: fair
Biological suitability: good
Drainage compatibility: poor, connects with lower Snake River
Compatibility with management goals: management of kokanee fishery is a concern
Overall assessment:
1. May support walleye at low level
2. May conflict with kokanee management
3. Unsuitable due to drainage incompatibility

BIG WOOD RIVER DRAINAGE

Fish Creek Reservoir
250 acres, 88 feet maximum depth
Species: Rb, Bk, Su
Primary fisheries: Rb, Bk
Physical suitability: poor, due to drawdown
Biological suitability: poor
Drainage compatibility: poor, connects with lower Snake River
Compatibility with management goals: management of popular rainbow trout fishery is a concern
Overall assessment:
1. Lacks potential for walleye establishment
2. May conflict with trout management
3. Unsuitable due to drainage incompatibility

Little Wood Reservoir
575 acres, 116 feet maximum depth
Species: Rb, Bk, Wf, Su
Primary fisheries: Rb, Bk
Physical suitability: poor
Biological suitability: poor
Drainage compatibility: poor, connects with lower Snake River
Compatibility with management goals: management of popular trout fishery is a concern
Overall assessment:
1. Lacks potential for walleye establishment
2. May conflict with trout management
3. Unsuitable due to drainage incompatibility

Mackay Reservoir
1,341 acres, 70 feet maximum depth
Species: Rb, Bk, Kok, Wf Primary
fisheries: Rb, Bk, Kok Physical
suitability: fair Biological
suitability: poor Drainage
compatibility: good
Compatibility with management goals: management of popular rainbow trout fishery is a concern
Overall assessment:
1. Lacks potential for walleye establishment
2. May conflict with trout management

Magic Reservoir
3,776 acres, 128 feet maximum depth
Species: Rb, Bn, Bk, Per, Wf, Su, Sq
Primary fisheries: Rb, Per
Physical suitability: fair
Biological suitability: fair
Drainage compatibility: poor, connects with lower Snake River
Compatibility with management goals: maintenance of popular trout fishery is a concern Overall assessment:
1. May support a fair walleye population
2. May conflict with trout management
3. Unsuitable due to drainage incompatibility

Mormon Reservoir
2,700 acres, 23 feet maximum depth
Species: Rb, Per, Su
Primary fisheries: Rb, Per
Physical suitability: fair
Biological suitability: fair
Drainage compatibility: poor, connects with lower Snake River
Compatibility with management goals: management of popular trout fishery is a concern Overall assessment:
1. May support walleye at low level
2. May conflict with trout management
3. Unsuitable due to drainage incompatibility

Carey Lake
200 acres, 20 feet maximum depth
Species: Lmb, Bg, Su, D Primary
fisheries: Bg, Lmb Physical
suitability: poor Biological
suitability: fair
Drainage compatibility: poor, connects with lower Snake River
Overall assessment:
1. Lacks potential for walleye establishment
2. Unsuitable due to drainage incompatibility

MALAD RIVER DRAINAGE

Deep Creek Reservoir
181 acres, 79 feet maximum depth
Species: Rb, Ct
Primary fisheries: Rb, Ct
Physical suitability: fair
Biological suitability: poor
Drainage compatibility: good
Overall assessment:
1. Lacks potential for walleye establishment

Daniels Reservoir
375 acres, 80 feet maximum depth
Species: Rb, Ct, Su, Ch
Primary fisheries: Rb, Ct
Physical suitability: fair
Biological suitability: fair
Drainage compatibility: good
Compatibility with management goals: maintenance of popular fishery for large trout is a concern
Overall assessment:
1. May support walleye at low level
2. May conflict with trout management

BEAR RIVER DRAINAGE

Alexander Reservoir
1,135 acres, 58 feet maximum depth
Species: Rb, Wf, Su, Sh, Ch, Cp, D
Primary fisheries: negligible
Physical suitability: poor, due to drawdown
Biological suitability: fair
Drainage compatibility: poor, could provide walleye to Bear Lake
Overall assessment:
1. May support walleye with regular stocking
2. Unsuitable due to drainage incompatibility

Twin Lakes Reservoirs
493 acres, 30 feet maximum depth
Species: Rb, Bg, Lmb
Primary fisheries: Rb, Bg, Lmb
Physical suitability: good
Biological suitability: fair
Drainage compatibility: good (closed system)
Compatibility with management goals: maintenance of highly-esteemed bluegill fishery is a concern
Overall assessment:
1. May support walleye at low level
2. May conflict with maintenance of bluegill fishery

Treasureton Reservoir

156 acres, 40 feet maximum depth
Species: Rb, Bg, Lmb, Sh, D, Cp
Primary fisheries: Lmb, Rb
Physical suitability: fair
Biological suitability: good
Drainage compatibility: good (closed system)
Overall assessment:

1. May support walleye at low level
2. Minimal conflict with other fisheries

Condie Reservoir

118 acres, 51 feet maximum depth
Species: Rb, Lmb, Bg
Primary fisheries: Bg, Rb
Physical suitability: fair
Biological suitability: fair
Drainage compatibility: good (closed system)
Compatibility with management goals: maintenance of popular bluegill fishery is a concern
Overall assessment:

1. May support walleye at low level
2. May conflict with maintenance of bluegill fishery

Foster Reservoir

145 acres, 65 feet maximum depth
Species: Rb, Su, Ch
Primary fisheries: Rb
Physical suitability: fair
Biological suitability: good
Drainage compatibility: good (closed system)
Overall assessment:

1. May support walleye at low level
2. Minimal conflict with other fisheries

Glendale Reservoir

232 acres, 72 feet maximum depth
Species: Rb, Bg, Su, Ch, Sh
Primary fisheries: Rb
Physical suitability: poor, due to drawdown
Biological suitability: good
Drainage compatibility: good
Overall assessment:

1. May support walleye at low level with regular stocking
2. Minimal conflict with other fisheries

LaMont Reservoir
92 acres, 65 feet maximum depth
Species: Rb, Su, Sh, Ch
Primary fisheries: Rb
Physical suitability: good
Biological suitability: good
Drainage compatibility: good (closed system)
Overall assessment:
1. May support walleye at low level
2. Minimal conflict with other fisheries

Weston Reservoir
112 acres, 39 feet maximum depth
Species: Lmb, Per, Rb
Primary fisheries: Per
Physical suitability: good
Biological suitability: good
Drainage compatibility: good (closed system)
Overall assessment:
1. May support walleye at low level
2. Minimal conflict with other fisheries

Montpelier Reservoir
120 acres, 73 feet maximum depth
Species: Rb, Ct, Bn
Primary fisheries: Rb
Physical suitability: fair
Biological suitability: poor
Drainage compatibility: poor, due to connection with Bear Lake
Compatibility with management goals: maintenance of popular trout fishery is a concern
Overall assessment:
1. Lacks potential for establishment of walleye
2. Unsuitable due to drainage incompatibility

Oneida Reservoir
515 acres, 102 feet maximum depth
Species: We, Per, Cp, Su Primary fisheries: We, Per Physical suitability: fair Biological suitability: good Drainage compatibility: good Overall assessment:
1. Has a self-sustaining moderate population of walleye

UPPER SNAKE RIVER DRAINAGE

Ashton Reservoir
- 350 acres, 56 feet maximum depth
- Species: Rb, Ct, Bk, Kok, Bn, Ch, Sh, Su
- Primary fisheries: Rb, Bn
- Physical suitability: fair
- Biological suitability: fair
- Drainage compatibility: poor, connects with lower Snake River
- Overall assessment:
    1. May support moderate walleye population
    2. Unsuitable due to drainage incompatibility

Island Park Reservoir
- 7,794 acres, 73 feet maximum depth
- Species: Rb, Ct, Bk, Kok, Ch, Su, D
- Primary fisheries: Rb, Bk, Kok
- Physical suitability: fair
- Biological suitability: fair
- Drainage compatibility: poor, connects with lower Snake River
- Compatibility with management goals: management of salmonid fishery is a concern
- Overall assessment:
    1. May support a moderate walleye population
    2. Unsuitable due to drainage incompatibility
    3. May conflict with maintenance of salmonid fisheries

Henrys Lake
- 6,050 acres, 22 feet maximum depth
- Species: Ct, Bk, Hyb
- Primary fisheries: Ct, Bk, Hyb
- Physical suitability: fair
- Biological suitability: fair
- Drainage compatibility: poor, connects with Island Park Reservoir and lower Snake River
- Compatibility with management goals: management of trout fishery is a concern
- Overall assessment:
    1. May support walleye at low level
    2. Unsuitable due to drainage incompatibility
    3. May conflict with maintenance of trout fisheries

Mud Lake

7,200 acres, 9.5 feet maximum depth
Species: Cr, Per, Bh, Lmb
Primary fisheries: Per, Bh
Physical suitability: poor
Biological suitability: good
Drainage compatibility: good (closed system)
Overall assessment:

1. May support walleye at low level
2. No conflict with other fisheries

Ririe Reservoir

1,560 acres, 181 feet maximum depth
Species: Rb, Bn, Co, Ct, Sh, Ch, Su
Primary fisheries: Rb, Co
Physical suitability: fair
Biological suitability: good
Drainage compatibility: poor, connects with lower Snake River
Compatibility with management goals: management of high yield and popular trout fishery is a concern
Overall assessment:

1. May support a good walleye population
2. Unsuitable due to drainage incompatibility
3. May conflict with maintenance of trout fisheries

Palisades Reservoir

16,200 acres, 245 feet maximum depth
Species: Ct, Bn, Lt, Ch, Sh, Su
Primary fisheries: Ct, Bn
Physical suitability: fair
Biological suitability: fair
Drainage compatibility: poor, connects with lower Snake River
Compatibility with management goals: maintenance of trout fisheries is a concern
Overall assessment:

1. May support walleye at low level
2. Unsuitable due to drainage incompatibility
3. May conflict with maintenance of trout fishery

MISCELLANEOUS SNAKE RIVER SYSTEM WATERS

Oakley Reservoir
1,350 acres, 129 feet maximum depth
Species: Rb, Per, Su, D, CC, Sh
Primary fisheries: Rb
Physical suitability: good
Biological suitability: good
Drainage compatibility: good (closed system)
Overall assessment:
1. May support a good walleye population
2. Minimal conflict with other fisheries

Murtaugh Lake
827 acres, 40 feet maximum depth
Species: Lmb, Per, Bh, Wf, Su, CC, Sh, Ch
Primary fisheries: Bh, Per, CC
Physical suitability: fair
Biological suitability: good
Drainage compatibility: poor, connects with lower Snake River
Overall assessment:
1. May support a fair walleye population
2. Unsuitable due to drainage incompatibility

Cedar Creek Reservoir
1,500 acres, 86 feet maximum depth
Species: Rb, Su, Sh, D
Primary fisheries: Rb
Physical suitability: fair
Biological suitability: fair
Drainage compatibility: poor, connects with lower Snake River
Overall assessment:
1. May support a fair walleye population
2. Unsuitable due to drainage incompatibility

Sublett Reservoir
113 acres, 44 feet maximum depth
Species: Rb, Bn, Ct, Sh
Primary fisheries: Rb, Bn, Ct
Physical suitability: poor
Biological suitability: poor
Drainage compatibility: good (closed system)
Compatibility with management goals: maintenance of popular salmonid fishery for large wild trout is a concern
Overall assessment:
1. Little potential for establishment of walleye
2. May conflict with trout management

Bray Lake

204 acres, 32 feet maximum depth
Species: Rb, Per, Su, CC, Sh
Primary fisheries: Per, CC
Physical suitability: poor
Biological suitability: fair
Drainage compatibility: good
Overall assessment:

1. May support walleye at low level with maintenance stocking
2. Minimal conflict with other fisheries

Chesterfield Reservoir

1,593 acres, 49 feet maximum depth
Species: Rb, Ct, Bn, Su, Ch
Primary fisheries: Rb, Ct
Physical suitability: fair
Biological suitability: good
Drainage compatibility: poor, connects with lower Snake River
Compatibility with management goals: management of popular trout fishery is a concern
Overall assessment:

1. May support walleye at moderate level
2. May conflict with trout management
3. Unsuitable due to drainage incompatibility

Salmon Falls Reservoir

3,400 acres, 223 feet maximum depth
Species: We, Ck, Su, Per, Cr, Smb, Rb
Primary fisheries: We, Rb, Ck
Physical suitability: good
Biological suitability: good
Drainage compatibility: good (closed system) .
Overall assessment:

1. Has a self-sustaining, strong population of walleye

MAINSTEM SNAKE RIVER

Lewiston to Hells Canyon Dam
10a river miles
Species: St, CC, Rb, Smb, Ck, SHD, Sq, Sh, Su
Primary fisheries: St, SHD, Rb, Smb, CC
Physical suitability: fair
Biological suitability: fair
Drainage compatibility: poor, connects with lower Snake River
Compatibility with management goals: inconsistent with anadromous salmonid management
Interagency consideration: Oregon Department of Fish and Wildlife would oppose introduction of walleye
Overall assessment:
1. May support walleye at low level.
2. Unsuitable due to drainage incompatibility
3. Unsuitable due to conflict with anadromous salmonid management

Hells Canyon Reservoir
2,500 acres, 318 feet maximum depth
Species: Rb, Co, Cr, CC, Per, Lmb, Smb, Cp, Su, Sq, Sh, Bh
Primary fisheries: Rb, Co. Smb
Physical suitability: good
Biological suitability: good
Drainage compatibility: poor, connects with lower Snake River
Interagency consideration: Oregon Department of Fish and Wildlife would oppose introduction of walleye Overall assessment:
1. May support a good walleye population
2. Unsuitable due to drainage incompatibility

Oxbow Reservoir
1,500 acres, 205 feet maximum depth
Species: Rb, Co, Cr, CC, Per, Lmb, Smb, Cp, Su, Sq, Sh, Bh, Bg
Primary fisheries: Rb, Co, Smb
Physical suitability: good
Biological suitability: good
Drainage compatibility: poor, connects with lower Snake River
Interagency consideration: Oregon Department of Fish and Wildlife would oppose introduction of walleye
Overall assessment:
1. May support a good walleye population
2. Unsuitable due to drainage incompatibility

Brownlee Reservoir
15,000 acres, 297 feet maximum depth
Species: Rb, Co, Cr, CC, Per, Lmb, Smb, Cp, Su, Sq, Sh, Bh, Bg
Primary fisheries: Rb, Co, Smb
Physical suitability: good
Biological suitability: good
Drainage compatibility: poor, connects with lower Snake River
Interagency consideration: Oregon Department of Fish and Wildlife would oppose introduction of walleye
Overall assessment:
1. May support a good walleye population
2. Unsuitable due to drainage incompatibility

Brownlee backwater to C.J. Strike Dam
140 river miles
Species: Rb, CC, St, Bg, Smb, Cp, Su, Sq, Bh
Primary fisheries: CC, Bh, Smb
Physical suitability: fair
Biological suitability: fair
Drainage compatibility: poor, connects with lower Snake River
Overall assessment:
1. May support walleye at low level
2. Unsuitable due to drainage incompatibility

C.J. Strike Reservoir
7,500 acres, 105 feet maximum depth
Species: Cr, Rb, Lmb, Bh, CC, Per, Su, Ch, Cp, Sq, St
Primary fisheries: Rb, Lmb, Cr, CC
Physical suitability: good
Biological suitability: good
Drainage compatibility: poor, connects with lower Snake River
Overall assessment:
1. May support a good walleye population
2. Unsuitable due to drainage incompatibility

C.J. Strike backwaters to Bliss Dam
49 river miles
Species: St, Rb, CC, Bh, Lmb, Su, Sh, Sq, Ch
Primary fisheries: Rb, St, CC
Physical suitability: fair
Biological suitability: good
Drainage compatibility: poor, connects with lower Snake River
Overall assessment:
1. May support walleye at low level
2. Unsuitable due to drainage incompatibility

Bliss Reservoir

254 acres, 84 feet maximum depth
Species: Lmb, CC, Smb, Cr, Ch, Su, Sh, Sq, Rb
Primary fisheries: CC, Lmb
Physical suitability: fair
Biological suitability: good
Drainage compatibility: poor, connects with lower Snake River
Overall assessment:

1. May support walleye at moderate level
2. Unsuitable due to drainage incompatibility

Lower Salmon Falls Reservoir

840 acres, 53 feet maximum depth
Species: CC, Lmb, Rb, Cr, Ch, Su, Sh, Sq
Primary fisheries: CC, Rb, Lmb
Physical suitability: fair
Biological suitability: good
Drainage compatibility: poor, connects with lower Snake River
Overall assessment:

1. May support walleye at moderate level
2. Unsuitable due to drainage incompatibility

Upper Salmon Falls Reservoir

810 acres, 60 feet maximum depth
Species: Rb, Lmb, Bg, CC, Su, Sh, Sq
Primary fisheries: Rb, Lmb, Bg, CC
Physical suitability: fair
Biological suitability: good
Drainage compatibility: poor, connects with lower Snake River
Overall assessment:

1. May support walleye at moderate level
2. Unsuitable due to drainage incompatibility

Milner Reservoir

760 acres, 73 feet maximum depth
Species: Rb, Wf, Per, Bh, Lmb, Smb, Cp, Su, Ch
Primary fisheries: Smb, Lmb
Physical suitability: fair
Biological suitability: good
Drainage compatibility: poor, connects with lower Snake River
Overall assessment:

1. May support walleye at moderate level
2. Unsuitable due to drainage incompatibility

Lake Walcott
11,850 acres, 74 feet maximum depth
Species: Cr, Rb, Kok, Per, Bh, Cp, Ch, Sh, Su
Primary fisheries: Rb
Physical suitability: fair
Biological suitability: good
Drainage compatibility: poor, connects with lower Snake River
Overall assessment:
1. May support walleye at moderate level
2. Unsuitable due to drainage incompatibility

American Falls Reservoir
56,100 acres, 80 feet maximum depth
Species: Rb, Per, Cp, Wf, Su, Sh, D, Cr, Ch
Primary fisheries: Rb
Physical suitability: good
Biological suitability: good
Drainage compatibility: poor, connects with lower Snake River
Compatibility with management goals: management of popular rainbow trout fishery is a concern
Overall assessment:
1. May support a good walleye population.
2. Unsuitable due to drainage incompatibility.
3. May conflict with trout management.

MISCELLANEOUS WATERS

Curlew Valley Reservoir
250 acres, 34 feet maximum depth
Species: Rb, Lmb, Cr, Cp, D, Sh
Primary fisheries: Lmb, Cr
Physical suitability: poor
Biological suitability: fair
Drainage compatibility: good
Compatibility with management goals: presently a popular large-mouth bass and crappie fishery, highly esteemed locally and should be maintained in present condition
Overall assessment:
1. Little potential for establishment of walleye.
2. May conflict with crappie and bass management

Compatible Waters

The waters in Table 3 were described in the preceding section as having at least some potential for establishment of walleye, along with a minimum of conflict with other significant fishery uses or plans.

Table 3. List of waters to be considered for walleye fisheries.

		Size (acres)	Stocking Requirement[a]
1.	Hauser Lake (Kootenai County)	550	275,000
2.	Twin Lakes (Kootenai County)	960	480,000
3.	Spirit Lake (Kootenai County)	1,280	1,280,000
4.	Treasureton Reservoir (Franklin County)	156	78,000
5.	Foster Reservoir (Franklin County)	145	72,500
6.	Glendale Reservoir (Franklin County)	232	116,000
7.	LaMont Reservoir (Franklin County)	92	46,000
8.	Weston Reservoir (Franklin County)	112	56,000
9.	Mud Lake (Jefferson County)	7,200	7,200,000
10.	Oakley Reservoir (Cassia County)	1,350	1,350,000
11.	Bray Lake (Gooding County)	204	102,000
12.	Salmon Falls Resv. (Twin Falls County)[b]	3,400	3,400,000
13.	Oneida Reservoir (Franklin County)[b]	515	257,500
	Totals	16,196	14,713,000

[a] Based on 500 fry per surface acre for waters smaller than 1,000 acres; 1,000 fry per surface acre for waters larger than 1,000 acres.

[b] Has existing walleye population.

The preceding list is advanced for consideration by the Idaho Fish and Game Commission and, if it is the desire of the Commission, the public and other appropriate agencies.

For an immediate (1983) initiation of a walleye program, we recommend including the three Kootenai County waters (Hauser, Spirit and Twin lakes), one of the Franklin County waters (Weston Reservoir), Mud Lake, Oakley Reservoir and Bray Lake, and continuing with walleye fisheries at Salmon Falls and Oneida reservoirs.

We suggest yearly stocking and evaluation over a five-year period. Results would provide direction for our walleye management, including expansion of the program into other waters.

An adequate supply of walleye eggs for this program is available from New Mexico.

In Kootenai County, Hayden Lake is another closed-system water that could probably support walleye. At 4,200 acres, it would be a significant addition to a walleye program for northern Idaho. However, desirability of walleye in Hayden Lake would have to be weighed against the importance of the existing westslope cutthroat restoration program at Hayden Lake. The present Commission policy is that "Native wild stocks of resident trout will receive priority consideration in all management decisions involving resident fish." Apparently a change in policy would be required to use walleye at Hayden Lake.

High yield kokanee fisheries have been traditional in the Idaho Panhangle. We are concerned that walleye may have a potential to impact kokanee in North Idaho waters, particularly at the early-life stage. Kokanee fisheries are problem ridden and under investigation and restoration at Pend Oreille and Priest lakes. This has heightened the current importance of kokanee in Coeur d'Alene and Spirit lakes. Even though small when compared to Priest, Pend Oreille or Coeur d'Alene lakes, Spirit Lake is highly regarded as a steady producer of nice-sized kokanee, and continues to be a popular spot for longtime kokanee anglers. The proper place of Spirit Lake in the total kokanee picture in the Idaho Panhandle should have a careful review (Departmental and public) before proceeding with introduction of walleye.

It is further recommended that Spirit Lake be used as a test situation before giving additional consideration to Coeur d'Alene Lake for introduction of walleye.

Evaluation

To improve our long-range planning for walleye management, evaluation should be performed of the following items, primarily at Spirit Lake:

1. Stocking densities in relation to successful establishment of walleye and optimal growth;
2. Food habits and growth;
3. Changes in abundance and size of other fish species;
4. Performance of the walleye fisheries, including catch rates, fishing pressure expended, and acceptability to the anglers; and
5. Development of a walleye population simulation model for use with Idaho waters (now in progress at University of Idaho).

Information Program

The material in this report should be condensed, adapted for popular consumption and presented in IDAHO WILDLIFE and newspapers.

A strong program to discourage unauthorized introductions of fish should be developed and implemented. A description of the interrelationships that exist among fish species and the factors that work toward success, failure, or compounding of fishery problems should be emphasized. We note that the Commission's 1975-1990 "Policy Plan" calls for increased information, education and enforcement efforts to reduce illegal transportation and release of undesirable fish species in lakes and reservoirs. However, we feel that there should be more follow-up in the most critical area--a thorough information program.

Additional Species

While we are attempting to discourage fish stocking "mistakes," the Department should become more visibly active in the use of suitable new species in waters where they may be necessary to improve underproductive fisheries. Largemouth bass, smallmouth bass, bluegill, crappies and channel catfish can probably be put to greater use in management programs on the mainstem Snake and nearby waters from American Falls Dam downstream. These species are already found in the lower Snake vicinity, thus added conflict with anadromous fish management would not occur. We believe that the range of smallmouth bass can be greatly expanded upstream in the Snake River and impoundments.

Many waters, in both the northern and southern parts of the state, have an unrealized potential for development of balanced bass-sunfish populations. Milner Reservoir, to cite one outstanding example, is in need of warmwater fishery development.

Some members of the bass family, such as white bass and striped bass, should be evaluated for potential additions to Idaho's fisheries. Hybrids and the spotted bass (Centrarchidae) are the likely candidates for consideration.

Fisheries for piscivorous fish cannot be highly successful without a strong forage fish population. The Department should investigate forage species that might improve certain fisheries. Emerald shiner and spottail shiner might be likely candidates for importation into the state.

We recommend that the Commission reexamine its policy for warmwater fish with the thought that more development and management effort would be appropriate for warmwater fisheries. Expansion of Idaho's warmwater fisheries will require forward-moving actions that should be specifically identified in the statewide fisheries plan and in the Department's budget.

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APPENDIX

SPECIES ABBREVIATIONS

Bluegill	Bg
Brook trout	Bt
Brown trout	Bn
Bull trout	Bt
Bullhead	Bh
Carp	Cp
Channel catfish	CC
Chinook salmon	Ck
Chub	Ch
Coho salmon	Co
Crappie	Cr
Cutthroat trout	Ct
Dace	D
Kokanee	Kok
Lake trout (mackinaw)	Lt
Largemouth bass	Lmb
Northern pike	Np
Pumpkinseed	Pu
Shiner	Sh
Smallmouth bass	Smb
Squawfish	Sq
Steelhead trout	SHD
Sturgeon	St
Sucker	Su
Tench	Te
Walleye	We
Whitefish	Wh
Yellow perch	Per

(Information request from Idaho Department of Fish and Game to Western States' fishery management agencies.)

February 18, 1982

In response to some public demand we are investigating the advisability of expanding the range of walleye (Stizostedion vitreum) in Idaho. Presently, walleye have only a very limited distribution in Idaho in closed systems (no access to Columbia River and the Pacific Ocean). Our assessment will consider the experiences and counsel of the other western states. Therefore, we are submitting this request for information that only you or your agencies can provide. We hope that you will view this request in a somewhat different light than the normal "...tell me everything about..." information requests that we all find burdensome. In this matter we will recommend an important fisheries management direction to the Idaho Fish and Game Commission and may draw heavily from your experience and advice.

If you have not had adequate experience with walleye to provide an informed response to the following concerns, please let us know. Otherwise, we would greatly appreciate information listed below.

1. How long have walleye been present to a significant extent in your state?

2. What is the extent of distribution? Number of lakes, reservoirs (in acres), streams?

3. How would you rate your walleye fisheries in terms of quality or satisfaction to anglers?

4. What are the primary forage species that walleye may be using?

5. Has competition with salmonids or other taxa been a problem?

6. For Oregon and Washington only -- Would you regard walleye introductions as a threat to anadromous fish smolts, should walleyes become established and spread into Hells Canyon, the lower Snake River and the lower Salmon River?

7. Has your department generated any original reports that we might find useful?

Your response will be greatly appreciated.

Sincerely,

ORIGINAL SIGNED BY
JAMES F. KEATING

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Boise, ID 83707

Dear Mr. Keating:

Walleye were introduced into the Sacramento River in 1874 and later released into five southern California reservoirs between 1959 and 1963. Both plants were unsuccessful because of poor returns to the angler and because reproduction did not occur. As far as we know, there are no walleye in the wild in California today. Also, there are no plans for further introduction.

Walleye sampled from the southern California lakes foraged heavily on threadfin shad with little predation on centrarchids noted. However, threadfin shad are very abundant in those lakes and food habits would probably be quite different in other California waters.

Walleye were not reintroduced in northern California because of concern over their possible impact on economically important species (salmon, steelhead, sturgeon, and striped bass) in the Sacramento-San Joaquin River system. The probable effect of their establishment on king salmon smolts was considered to have "catastrophic potential".

I have enclosed copies of reports that synopsize our experience with walleye. I hope they are of assistance to you.

Sincerely,

Leonard Fisk, Chief
Inland Fisheries Branch

Enc.

STATE OF MONTANA

DEPARTMENT OF
FISH AND GAME
1420 East 6th Avenue
Helena, Montana 59620
March 1, 1982

Mr. James F. Keating
Idaho Department of Fish and Game
600 South Walnut, Box 25
Boise, Idaho 83707

Dear Jim:

I have the following comments in response to your question on walleye in Montana.

1. We don't know for sure, walleye were present in eastern Montana when I went to work in Miles City in 1951. They have been planted primarily in reservoirs east of the Continental Divide and we have fair to good walleye fishing in Tiber Reservoir, a 15,000 acre impoundment on the Marias River north of Great Falls; Nelson Reservoir, 4,000 acre impoundment near Malta; and the Big Dry Arm of Fort Peck Reservoir, a 250,000 acre impoundment on the Missouri. Also we have a good walleye fishery in the Missouri River immediately below Fort Peck Dam near Glasgow. That fishery has improved markedly in recent years following North Dakota's management efforts for walleye in Garrison Reservoir, the next mainstem impoundment on the Missouri downstream from Fort Peck.

2. Enclosed is a copy of the distribution map of walleye from C.J.D. Brown's Fishes of Montana. They have probably been stocked in another 10 to 15 reservoirs since Dr. Brown's book was published so I would estimate they are in 30 to 40 Montana waters today. I don't know the acreage; however, since they are in Fort Peck which is 250,000 acres the addition of the other waters wouldn't change that figure greatly.

3. Except for the waters in number 1 above I would rate our walleye fisheries as occasional and not at all outstanding. The satisfaction to anglers comes primarily from the walleye's excellent quality as a food fish.

4. They appear to utilize any other small fish that are present. Our major problem with walleye seems to be maintaining a sufficient forage base to provide good growth rates. The walleye's ability to consume forage is phenomenal. Prior to their introduction in Tiber Reservoir we used to take four to five hundred suckers in our annual gill net series, today the same series of nets takes less than 100 suckers all of a size that makes them

unavailable to the walleye. In Fort Peck our most numerous small cyprinid is the emerald shiner and the walleye feed heavily on these. We are presently going through the environmental review process necessary to introduce the spottail shiner to Fort Peck to improve the forage base for walleye. North Dakota approached this problem in Garrison by the introduction of rainbow smelt. It is my understanding that their walleye growth rates increased phenomenally; however, I also learned recently that for the past couple of years walleye reproduction has dropped markedly. We now have rainbow smelt runs up the Yellowstone as far as Glendive and up the Missouri to Fort Peck Dam. Our walleye growth rates in the Missouri just below Fort Peck have increased coincident with the arrival of the smelt. We do not feel it would be wise to introduce smelt into Fort Peck for two reasons. First we think they might be a real detriment to walleye reproduction in the reservoir. That reproduction is not nearly as good as it is in Garrison because we have Bearpaw shale instead of gravel in most of the areas where walleye would like to spawn. Secondly, putting rainbow smelt above Fort Peck would allow them access up the Missouri to Great Falls and up the Marias to Tiber Dam and we believe they would not be compatible with trout. I suspect; however, that it is only a matter of time until some enterprising angler who is aware of what happened in Garrison, moves them over the dam illegally.

5. No, but we would certainly not recommend introducing walleye in good trout water. Walleye were planted about 30 years ago in two run-of-the-river impoundments on the Missouri near Helena. They are occasionally still taken in these reservoirs and also in the Missouri River downstream, all of which are predominantly trout water. Walleye are taken only very occasionally in that area, apparently they have never been able to establish themselves well which is perhaps fortunate for the trout fishermen.

7. No.

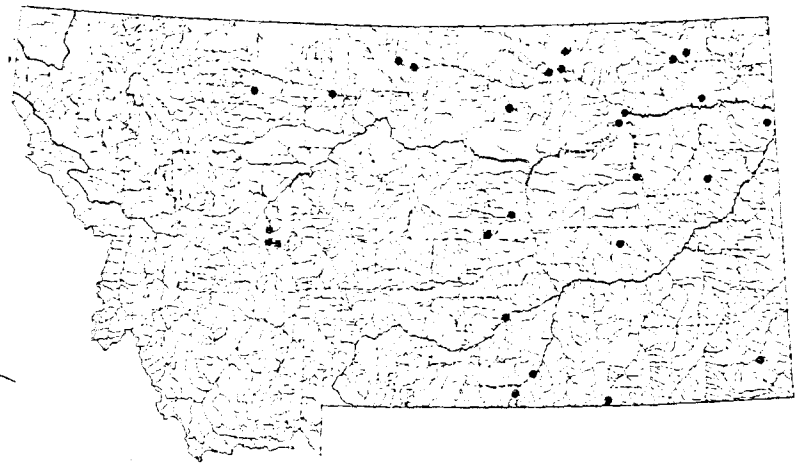
In summary, I would only add that our philosophy on introducing exotic species has been that they must have a very high potential for improving sport fishing and almost no potential for causing damage to native species. I believe walleye do not meet those criteria in trout waters.

Sincerely,

Art

Arthur N. Whitney
Administrator
Fisheries Division

ANW/bjm
Encl.



Body fusiform and quite robust; covered with ctenoid scales (80-91 in lateral line). Color of back and side olive-buff; back with 6-8 faint black blotches; side finely mottled with black or brown; belly white. Head elongate; snout quite pointed; mouth large and oblique; jaws with strong teeth; cheek usually scaleless; gill membranes separate. Spinous dorsal fin with dark spot on posterior base; pelvic fins and lower margin of caudal milky white.

The natural range of the walleye extends from the Mackenzie and Peace rivers of Canada south to Alabama and from the Dakotas and Texas east to the Atlantic Coast. This species is not native to Montana and we have no reliable information regarding the time and place of the first introduction. It has been propagated in Montana at least 30 years and many plants have been made mostly in impoundments east of the Continental Divide. Its present distribution is mainly in the Missouri and Yellowstone drainages.

Walleye become sexually mature after 2 to 4 years with males often maturing a year in advance of females. Females produce about 50,000 eggs on the average but very large individuals may produce 900,000. Spawning occurs when water temperatures reach 40 to 50 F. There is usually some migration either upstream or to suitable rocky areas in lakes. Eggs are deposited at random and settle to the bottom where they incubate for 12 to 18 days before hatching. No parental care of eggs or fry exists.

The approximate average length of walleyes at each year of life in Montana waters follows: 1 year — 4.5 inches; 2 years — 9 inches; 3 years — 13 inches; 4 years — 16 inches; 5 years — 19 inches. The oldest specimen on record here was 7 years but individuals as old as 18 years have been reported from outside the state. The largest Montana specimen known was 31.5 inches in length and weighed 12.8 pounds. Individuals as long as 45 inches and weights up to 20 pounds are on record in other states.

Most kinds of aquatic invertebrates are eaten by both small and large walleyes. Adults feed heavily on small fish when these are available.

The walleye can be taken on a variety of spoons, plugs, and flies. Minnows or worms are also effective baits. The flesh of walleye is white, firm and of excellent flavor.

Feb. 2, 1982

Fisheries Biologist
Montana Dept. Fish & Game

Dear Sir:

I am trying to gather some facts about Walleyes, and would like to know if the State of Montana has any studies available, that were conducted in connection with these fish being planted in your State? Are there any rivers or lakes in Montana which hold both Walleyes and Trout?

We are trying to have Walleyes planted in the Snake River near here, and although there aren't many trout in this section, some are concerned about the river below, in case of future spread.

We will be very grateful for any and all information that you could supply us with. We need any information that you might have on the compatability of Walleyes and trout.

Yours truly,

George L. Korb

George L. Korb
370 N. Miller Ave.
Burley, Id.
83318

STATE OF MONTANA

DEPARTMENT OF

FISH AND GAME

1420 East 6th Avenue
Helena, Montana 59620

March 3, 1982

Mr. George L. Korb
370 North Miller Avenue
Burley, Idaho 83318

Dear Mr. Korb:

Montana has no waters that afford both good walleye and good trout fishing. For the most part we've introduced walleye only in lakes and reservoirs that had no, or very few, trout in them to begin with and that did not drain into good trout waters. The only exception to this was the introduction of walleye into two small run-of-the-river impoundments on the Missouri River near Helena in the early 1950's. These two reservoirs have remained good trout fisheries with stocking and the Missouri River between Helena and Great Falls is an excellent trout stream sustained through natural reproduction. Although an occasional walleye is still taken in these reservoirs no appreciable fishery for them ever developed, apparently their survival and reproduction was very marginal in those waters, which we now feel was perhaps fortunate for the trout fisherman. Walleye are very predacious and will utilize any smaller fish for food. In the areas where we have good numbers of walleye we have difficulty maintaining a sufficient forage base to maintain good growth rates. Thus we would not recommend introducing them any place where they could have access to good trout or salmon waters. Our philosophy on the introduction of an exotic species is that it must have a very high potential for improving sport fishing and almost no potential for damaging native game fish species. We do not believe the walleye can meet those criteria in good trout waters.

Sincerely,

Arthur N. Whitney
Administrator
Fisheries Division

ANW/bjm

STATE OF MONTANA MAR 3 1982

DEPARTMENT OF

FISH AND GAME

1420 East 6th Avenue
Helena, Montana 59620
March 3, 1982

Mr. George L. Korb
370 North Miller Avenue
Burley, Idaho 83318

Dear Mr. Korb:

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Sincerely,

Arthur N. Whitney
Administrator
Fisheries Division

ANW/bjm

STATE OF UTAH
NATURAL RESOURCES & ENERGY
Wildlife Resources

Scott M. Matheson, Governor
Temple A. Reynolds, Executive Director
Douglas F. Day, Division Director

1596 West North Temple • Salt Lake City, UT 84116 • 801-533-9333

February 26, 1982

Mr. James F. Keating, Chief
Bureau of Fisheries
Idaho Department of Fish and Game
600 South Walnut, Box 25
Boise, Idaho 83707

Dear Jim:

Utah has only had limited experience with walleye fisheries and subsequently has also only limited information. However, I will attempt to provide what information we can as you requested.

1- A very limited walleye fishery has been present in Utah at least for the past 25 years.

2- The distribution at the present time is limited, but we have made some effort, and may expand this effort, to increase walleye fisheries in the future. Basically, in Utah they are confined to two large bodies of water; namely, Utah Lake and Lake Powell. They have a combined surface area of 248,000 acres. Limited fisheries exist in Yuba Reservoir (11,000 acres) and were recently introduced into Starvation Reservoir (7,184 acres) and 5 or 6 miles in the Bear River below Cutler Reservoir.

3- In all of the waters mentioned above, with the possible exception of Lake Powell, we have yet to develop a fishery of a quality which will attract considerable angler use. Basically, ~~the most~~ fishing pressure for walleye in those waters is directly related to relatively low population numbers and, thus, limited rate of success. To a lesser degree, catchability of walleyes may also be a factor. In Lake Powell, a large population of walleye have developed entirely from natural reproduction. A very limited number of walleye were in the Green and Colorado Rivers prior to impoundment of the Colorado River and the development of Lake Powell. In this case, because of catchability, angling pressure has been slow to develop. However, as the walleye populations increased, anglers are now beginning to learn techniques for the taking of walleye and fishing pressure is increasing. We expect in future years that it will gain considerable popularity.

4- It has been our experience that walleye will take practically any species of fish which are available to them until their size prevents foraging. I suspect the main problem will be, if a good walleye population is developed, to maintain a suitable forage base. Our experience indicates the Utah chub is incapable of maintaining themselves in the face of a substantial walleye population. In Lake Powell, we are fortunate to have water temperatures suitable to maintain a relatively large threadfin shad population and, as of this date, do not have an obvious forage base problem. However, we are beginning to suspect that they may be influencing the black bass and crappie populations. We have not introduced walleye and salmonid together because we feel salmonids could not compete with walleye. This probably would be the case even if catchable size salmonids were introduced if the walleye population was composed of a reasonably large number of walleye three years or older. As indicated in question 4, we may be having some adverse competition with sun fishes in Lake Powell as well as crappie. Utah streams do not particularly appear adapted for walleye and even though they are present in the Green and Colorado Rivers there numbers are so low that they are not in any way a limiting factor on other fish populations. I indicated earlier that we are looking at perhaps expanding our walleye program. We are looking at those so-called "cool" waters which are really not suitable for trout nor are they really suitable for warmwater fisheries such as bass, bluegill, crappie, etc.

I realize the above comments are rather limited, but perhaps they may be of some value in determining the course Idaho will follow.

Sincerely,

Don Andriano
Chief of Fisheries

DA:bbc

State of New Mexico

GOVERNOR
BRUCE KING

DIRECTOR AND SECRETARY
TO THE COMMISSION
HAROLD F. OLSON

STATE GAME COMMISSION
EDWARD MUNOZ, CHAIRMAN
GALLUP

J.W. JONES
ALBUQUERQUE

ROBERT H. FORREST
CARLSBAD

BILL LITTRELL
CIMARRON

JAMES H. KOCH
SANTA FE

DEPARTMENT OF GAME AND FISH

STATE CAPITOL
SANTA FE
87503

March 8, 1982

Mr. James F. Keating, Chief
Bureau of Fisheries
Idaho Department of Fish and Game
P. O. Box 25
Boise, Idaho 83707

Dear Mr. Keating:

We are pleased to respond to your request for information concerning our walleye fisheries and our experience with them. But first, let me give you a general overview of New Mexico's fisheries - in case you are not familiar with our State. We have five major river systems draining the State - the San Juan and Gila rivers are part of the Colorado system and do not contain walleye in New Mexico; the Rio Grande, our major river, drains south out of Colorado the length of the State and on into Texas and its major tributary (which occurs in Texas); the Pecos River; and then the Canadian River which drains east into Texas. All of these major river systems have waters which contain walleye, usually in the lower ends of the drainage. Our trout waters are concentrated in the northern part of the State and, of course, in the high country in the southern part.

We have 40 odd years' experience with walleye and during that time have expanded their range into all of the major warm-water fisheries in the State. As New Mexico is a water limited state, it is fairly easy to answer your second question by referring to the attached table. Additions to the attached table would be very limited walleye fisheries in downstream reaches below the reservoirs listed. The only exception to that would be Cochiti Reservoir, which is an impoundment on the main stem of the Rio Grande in which introduced walleye could move upstream into Colorado. However, this fisheries is relatively new and we do not possess any information on upstream movements, if any.

Questions 3 and 4 are generally answered in the attached table but to address the quality or satisfaction, generally our anglers who catch walleye like them. We occasionally receive complaints that walleye "eat up all the crappie" or "are hurting the bass, et cetera". I am sure you have heard the same type of complaints with walleye or other species. Their primary forage

is gizzard shad. Threadfin shad have recently been introduced into Elephant Butte and subsequently downstream to Caballo and are now one of the primary prey species in those reservoirs. Two lakes with walleye in which shad do not occur are Cochiti and Clayton. The diet at Cochiti is questionable at this time but probably consists of small centrarchids, chubs, suckers, and possibly small catfish.

The one lake on the attached table which is a trout water, Clayton Lake, has contained walleye for about 20 years. However, in 1981, due to the poor contribution to the fishery, it was recommended by the area fish manager that we reduce the walleye population, at least the large 6+-pound individuals. A public meeting to discuss this recommendation indicated no opposition and in fact, nearly complete agreement from the angling public (they want to catch trout). As we conduct a walleye spawning operation every year and have for the past 14 years, we included Clayton Lake in the operations during 1981. All walleye caught for this spawning operation were removed from the lake.

We are taking the liberty of responding to question six for Oregon-Washington only. We have resisted stocking walleye in salmonid waters. In one water in particular, our reasoning has been that we feel that they would severely impact the salmonid fishery by several means: (1) they will prey on salmonids in addition to target prey species, in this case white suckers; (2) they are higher on the food chain than salmonids; (3) there is the potential for an excellent reproducing population of walleye which would not contribute to the fishery in proportion to their population; (4) they could also move downstream into two more reservoirs with the possibility of movement into 40 miles of trout stream; and (5) probably the main reason, we can produce more fish and angler days with salmonids than we can with walleye (plus 80% of our fishermen fish for trout).

Additionally, we have two case histories that may be of value in your determinations. One deals with a 150-acre lake in which white suckers were a problem. Northern pike were introduced and this particular lake is now basically a northern pike only fishery. They did control the suckers but they also controlled the trout. Case number two is a Department-owned, 300-acre lake with a substantial population of yellow perch. For the past several years, we have undertaken netting operations to determine the effect of removal of thousands of these yellow perch on the trout population. I have attached the latest report on this lake.

If I can be of further assistance, please do not hesitate to contact me.

Sincerely,

Harold F. Olson, Director

By: Richard N. McCleskey
Chief of Fisheries

jal
Atts.

Generalized ratings of walleye fisheries in New Mexico. Estimated angler days and harvest are for 1978. Angler days are fishing effort for all species in lake and not just walleye - (.000) average catch of walleye per angler day.

Water (Reservoirs)	x Size (Acres)	Estimated Angler Days (1978)	Estimated Number Walleye Harvested (1978)	Primary Forage	General Status of Walleye Population	Overall Rating of Walleye Fishery
Elephant Butte	12,000	83,296	1,533 (.018)	Gizzard shad Threadfin shad	Good	Poor
Caballo	3,000	29,994	2,619 (.087)	Gizzard shad Threadfin shad	Fair	Fair
Conchas	8,000	34,552	20,739 (.600)	Gizzard shad	Excellent	Excellent
Ute	4,000	60,171	15,512 (.258)	Gizzard shad	Excellent	Very Good
Sumner	1,200	10,091	1,200 (.119)	Gizzard shad	Fair	Good
McMillan	800	2,289	0 0	Gizzard shad	Poor	Poor
Cochiti	1,200	33,626	3,713 (.110)	?	Good	Good
Clayton	100	8,013	292 (.036)	Sunfish Rainbow Catfish	Good	Poor

STATE OF COLORADO
Richard D. Lamm, Governor
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE
Jack R. Grieb, Director
6060 Broadway
Denver, Colorado 80216 (825-1192)

April 20, 1982

James Keating
Chief of the Bureau of Fishery
Idaho Department of Fish and Game
600 South Walnut
Box 25
Boise, Idaho 83707

Dear Mr. Keating:

Your letter of February 18, 1982, investigating the advisability of expanding the range of walleye in Idaho has been forwarded to me for answering. Colorado has a very active walleye management program. This fish, introduced into the state in 1950, has become a very popular fishing target. Currently the walleye can be found in about 40 waters on the east side of the Continental Divide in Colorado. In addition, the fish has been stocked on a limited basis in impoundments on the western side of the Continental Divide. Total acreage involved is approximately 35 thousand acres. No walleye populations are maintained in streams.

Walleye in many situations in Colorado do not reproduce. To maintain the populations supplemental stocks of fry are introduced on a yearly basis.

The walleye is a popular species. However, when walleye are introduced into a body of water there is generally a decline in the panfish fishery. Total catch rate usually decline.

The gizzard shad and the yellow perch are the primary forage species upon which walleye prey. The Division of Wildlife has no information pertaining to the competition of the salmonids and walleye since we do not stock them into trout waters.

I hope this information is of some benefit to you.

Sincerely,

JOHN WOODLING
Wildlife Progrma Specialist

JW/w

THE STATE OF WYOMING

ED HERSCHLER
GOVERNOR

Game and Fish Department

CHEYENNE, WYOMING 82002

EARL M. THOMAS
DIRECTOR

February 25, 1982

Mr. James Keating
Chief of Fisheries
Idaho Department of Fish and Game
Box 25
Boise, Idaho 83707

Dear Mr. Keating:

In response to your letter of February 18, 1982, concerning the distribution of walleye in the State of Wyoming, we have put together the following information:

Walleye were first stocked in Wyoming in 1936 but apparently the plant did not take. They were restocked again in 1943 and 1946 and have contributed to the fishery in the state ever since. We presently have a yearly walleye stocking program where anywhere from 10 to 40 million walleye fry are released in reservoirs where established walleye populations are present. We have been stocking some of our larger reservoirs on a two to three year rotation basis. We presently have some studies going evaluating the most effective stocking, whether it be one or two years with a rest period, or yearly. To date we have no information concerning the effectiveness of this program, however, the State of Colorado has developed a program along these lines and should have some information that is either published or will be soon.

Walleye in the State are found in the Big Horn, Powder, Platte River drainages. Presently they do not occur in the Green River or Snake River drainages. We estimate that lakes comprising a total of approximately 99,000 surface acres have substantial walleye populations. Most of these are large reservoirs on the Platte and Big Horn rivers. We also estimate that walleye are present in approximately 594 miles of stream. While in many areas river populations seem to fluctuate during spawning runs upstream from large reservoirs, there are definitely resident walleye populations which have established in rivers, particularly in the Platte.

Either on their own or with the help of fishermen, the populations are expanding. I might add, in most cases, much to our dismay. Anglers who fish for walleye and are schooled in methods to catch them are generally very well satisfied with the quality. They think they are excellent eating and expound the merits at great length. However, in the State of Wyoming these anglers are relatively

few and far between and most of our fishing populace is orientated more toward the salmonid species. There are only two major reservoirs in the state where the walleyes support the majority of the fishing and angling is specifically directed at them. In these areas the catch rates have remained relatively high and the walleye definitely fills a void, at least with our current management program. However, if the walleye were not present, we would probably manage the reservoirs with extensive fingerling rainbow plants and would probably please a broader spectrum of fishermen within the state.

One of the big problems we have been having with walleye, particularly in the Seminoe Reservoir, is the fact that they have wiped out the natural forage species that were available and growth rates have slowed considerably. We are presently experimenting with different forage species primarily shad, emerald shiner, spottail shiner to see if we can fill this void. While we have had some positive results, as of yet our success has not been particularly notable.

In any reservoir that was originally stocked with salmonids, the competition with the walleye or possibly lack of competition, since the salmonids appear to be quickly eaten, have required a complete revision of our management plans. On some of these lakes it is completely impractical now to stock fingerling trout because returns to the creel are extremely low. This is almost certain in most instances to be a direct result of walleye predation. I cannot think of a single place where I consider a walleye fishery and a trout fishery as being compatible. There are some where they are maintained together but without the walleye I feel assured that the trout fishing would be much better. As I've stated previously, there are also several reservoirs where we have had to stop stocking trout completely because of poor returns. We have a major study presently going on Seminoe Reservoir trying to evaluate the size and stocking time on trout species to avoid as much of the problem walleye predation as possible. Walleye in the river systems, particularly the Platte, are not having as direct an effect on trout fishery as in the reservoirs. However, we feel predation does occur and they are not adding anything to the fishery in these circumstances.

In a very brief summary let me say that in my opinion in any water that you have intention of managing for a salmonid population, you would be better off without walleye being present. This must be becoming quite an issue in the State of Idaho since we've received a couple of letters from the public concerning our walleye management plan. I responded to one of these a couple of weeks ago and sent a copy of my response to Jerry Conley. He should have it if he hasn't already forwarded it on to you.

If we can be of anymore help, please let us know.

Sincerely,

Joseph R. White
Chief, Fish Division

JRW/jp

Oregon Cooperative
Fishery Research Unit
Department of
Fisheries and Wildlife

Oregon State University

104 Nash Hall
Corvallis, Oregon 97331
(503) 754-4531
(FTS 425-4531)

COOPERATING AGENCIES:
Oregon Department of Fish and Wildlife
Oregon State University
U. S. Fish and Wildlife Service

September 21, 1982

David W. Ortmann, Fishery Research Supv.
Idaho Department of Fish & Game
600 S. Walnut
Boise, Idaho 83707

Dear Mr. Ortmann:

In response to your letter of September 7, 1982, I did study the feeding ecology and life history of the Columbia River walleye in 1980-1981. I found that walleye stomachs contained over 99% by volume of fish and that the single most important food item was sculpins (23-34% by volume), followed by two species of suckers (33-39% combined volumes), cyprinids (15-34%), and salmonids, primarily chinook (4-6%). I believe that salmonids are buffered by an abundance of alternate prey and by a spatial separation from feeding walleye due to differing responses to dimming light. Walleye are crepuscular feeders, and the primary prey listed above tend to settle on the bottom and become inactive in dimming light. Juvenile salmonids, on the other hand, rise to the surface and actively swim downstream in dimming light. I have also found that this walleye population has growth rates (743 mm TL at age 8) and fecundity (82,900 eggs x kg body weight^{-1}) which are among the highest previously reported. I believe that these factors are the result of optimal water temperatures and a nonlimiting food supply.

It is difficult to unequivocally state whether or not walleye will have an adverse effect on anadromous salmonids as we do not have a walleye population estimate and it appears that the population is still growing at this time. If this is true, and the walleye population outstrips the current prey base, I would expect them to become a more serious predator of salmonids.

I hope that this information will help you. If you need additional information, please contact me. You might also contact Jerry Grey, USFWS, Cook, Washington, who is supervising a continuing study of walleye and squawfish predation in the Columbia River.

Sincerely,

Alec G. Maule

AGM:ah